

LUBRICATION(H4DO)

LU(H4DO)

1. General Description
2. Oil Pressure System
3. Engine Oil
4. Oil Level Gauge
5. Oil Filter
6. Oil Pump
7. Oil Pan
8. Oil Pressure Switch
9. Engine Oil Cooler
10. Oil Pipe
11. Symptoms and causes

LUBRICATION(H4DO) > General Description

CAUTION

- When performing service operation, refer to "Repair Contents" in "General Description".  Ref. to REPAIR CONTENTS>Repair Contents.
- Prior to starting work, pay special attention to the following:
 - Always wear work clothes, a work cap, and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
 - Protect the vehicle using a seat cover, fender cover, etc.
 - Prepare the service tools, clean cloth, containers to catch grease and oil, etc.
- Prevent scattering of grease and oil. If it scatters, wipe it off immediately to prevent it from penetrating the floor or flowing out, to protect the environmental.
- If the grease and oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.
- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary work.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground terminal from the battery sensor.
- Always use the jack-up point when the lifting device, shop jacks or rigid racks are used to support the vehicle.
- Before starting works, remove dirt and corrosion around the target area.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.
- For the parts except for the non-reusable parts, replace then with new parts if necessary.
- Be sure to tighten bolts and nuts to the specified torque.
- Always use new application oil during work.
- Follow all government and local regulations concerning disposal of refuse when disposing of engine oil.

LUBRICATION(H4DO) > General Description

SPECIFICATION

1. LUBRICATION METHOD

Lubrication method	Forced lubrication type
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2. OIL PUMP

Pump type		Trochoid type
Number of teeth	pcs.	Inner rotor
		Outer rotor
Outer rotor diameter × Thickness	mm (in)	71.4 × 14 (2.81 × 0.55)
	Dischar	

Performance (Oil temperature 120°C (248°F))	600 r/min (Engine speed)	ge pressure	kPa (kg/cm ² , psi)	27 (0.28, 3.92)
		Discharge rate	L (US qt, Imp qt)/min	5.8 (6.1, 5.1) or more
	6,000 r/min (Engine speed)	Discharge pressure	kPa (kg/cm ² , psi)	321 (3.27, 46.6)
		Discharge rate	L (US qt, Imp qt)/min	46.3 (48.9, 40.7) or more
Relief valve working pressure (2-step relief)	1st opening pressure		kPa (kg/cm ² , psi)	150 (1.53, 21.8)
	Main opening pressure		kPa (kg/cm ² , psi)	700 (7.14, 101.5)

3. OIL FILTER

Filter type	Full-flow filter type	
Filtration area	cm ² (sq in)	900 (139.5)
By-pass valve opening pressure	kPa (kg/cm ² , psi)	160 (1.6, 23.2)
Outer diameter × Length	mm (in)	80 × 65 (3.15 × 2.56)
Installation screw specifications		M 20 × 1.5

4. OIL PRESSURE SWITCH

Type	Immersed contact point type	
Operating voltage	V	12
Warning light operating pressure	kPa (kg/cm ² , psi)	14.7 (0.15, 2.1)
Proof pressure	kPa (kg/cm ² , psi)	1,180 (12.0, 171.1)

5. ENGINE OIL

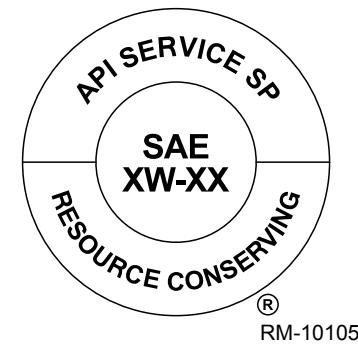
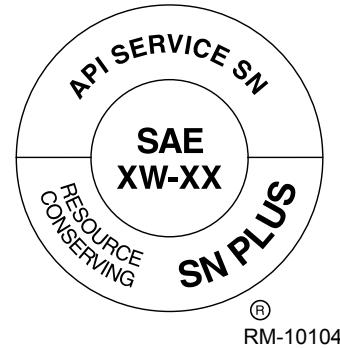
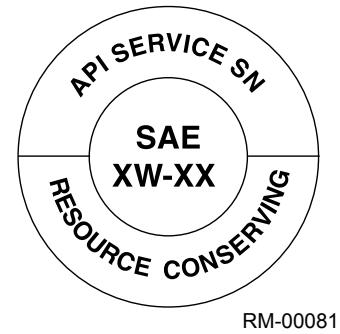
- TYPE

Caution:

- Use 0W-20 (synthetic oil).
- It is acceptable to fill with an engine oil of another brand, but make sure to use the engine oil corresponding to the following standards.

Item	Recommended and alternative materials

API standard



Those with SN, SN PLUS or SP "RESOURCE CONSERVING" logo.

ILSAC standard



Those with GF-5 or GF-6A "starburst mark" displayed on top of the container.

0W-20 (synthetic oil) specified

SAE viscosity No. and applicable temperature

(°C)	-30	-20	-15	0	15	30	40
(°F)	-22	-4	5	32	59	86	104

0W-20 (synthetic oil) Specified

RM-10002

• **CAPACITY**

Total capacity (at overhaul)	L (US qt, Imp qt)	5.9 (6.2, 5.2)
When replacing engine oil and oil filter	L (US qt, Imp qt)	5.0 (5.3, 4.4)
When replacing engine oil only	L (US qt, Imp qt)	4.8 (5.1, 4.2)

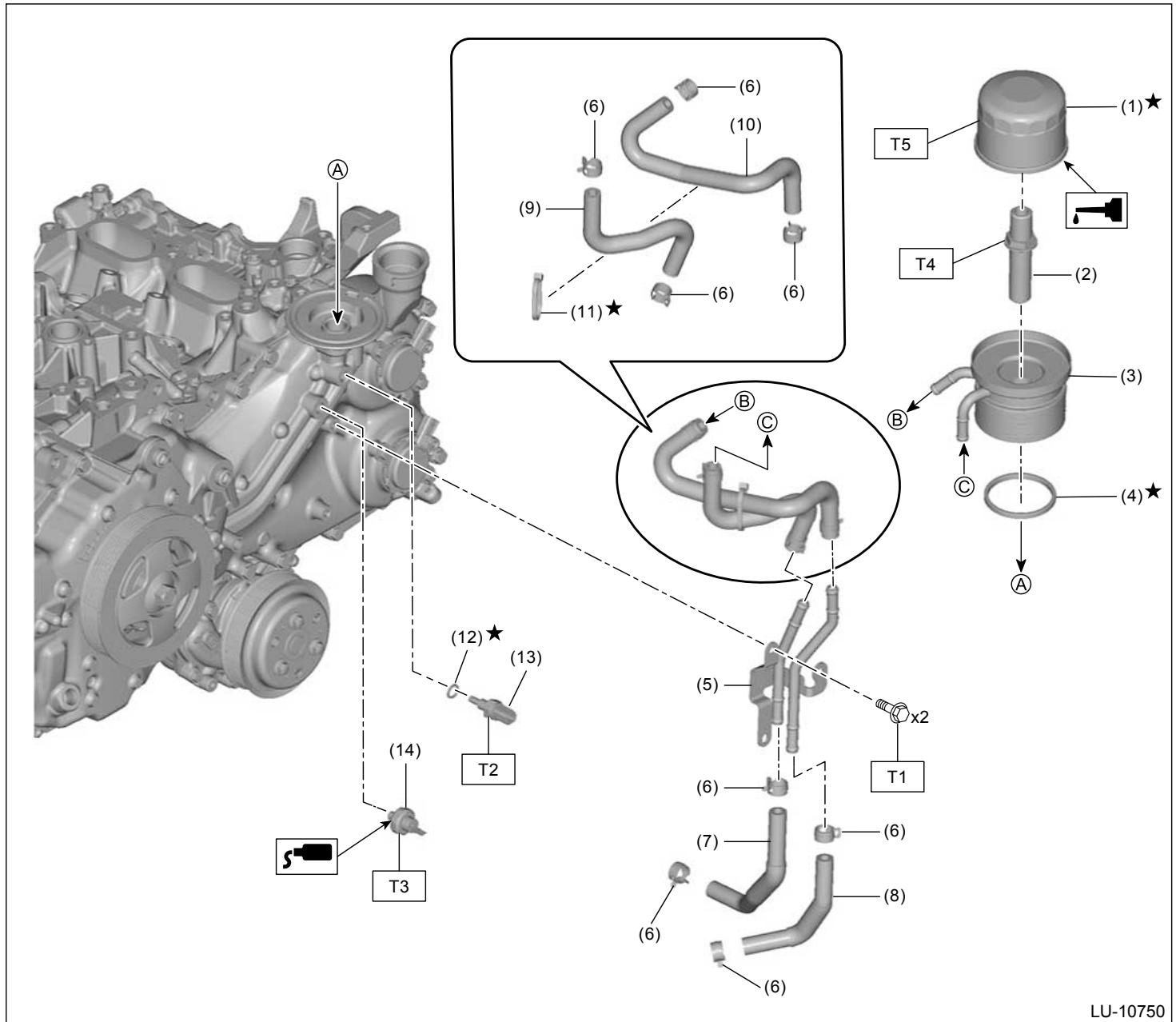
LUBRICATION(H4DO) > General Description

COMPONENT

1. OIL LEVEL GAUGE

For the components of the oil level gauge, refer to "MECHANICAL (H4DO)".  [Ref. to MECHANICAL\(H4DO\)>General Description>COMPONENT > CHAIN COVER.](#)

2. OIL FILTER & ENGINE OIL COOLER



LU-10750

- | | |
|--------------------------|------------------------------------|
| (1) Oil filter | (8) Water hose |
| (2) Oil cooler connector | (9) Water hose |
| (3) Engine oil cooler | (10) Water hose |
| (4) O-ring | (11) Tie-wrap |
| (5) Oil cooler pipe | (12) O-ring |
| (6) Clip | (13) Engine oil temperature sensor |
| (7) Water hose | (14) Oil pressure switch |

Tightening torque: N·m (kgf·m, ft-lb)

T1: 6.4 (0.7, 4.7)

T2: 16 (1.6, 11.8)

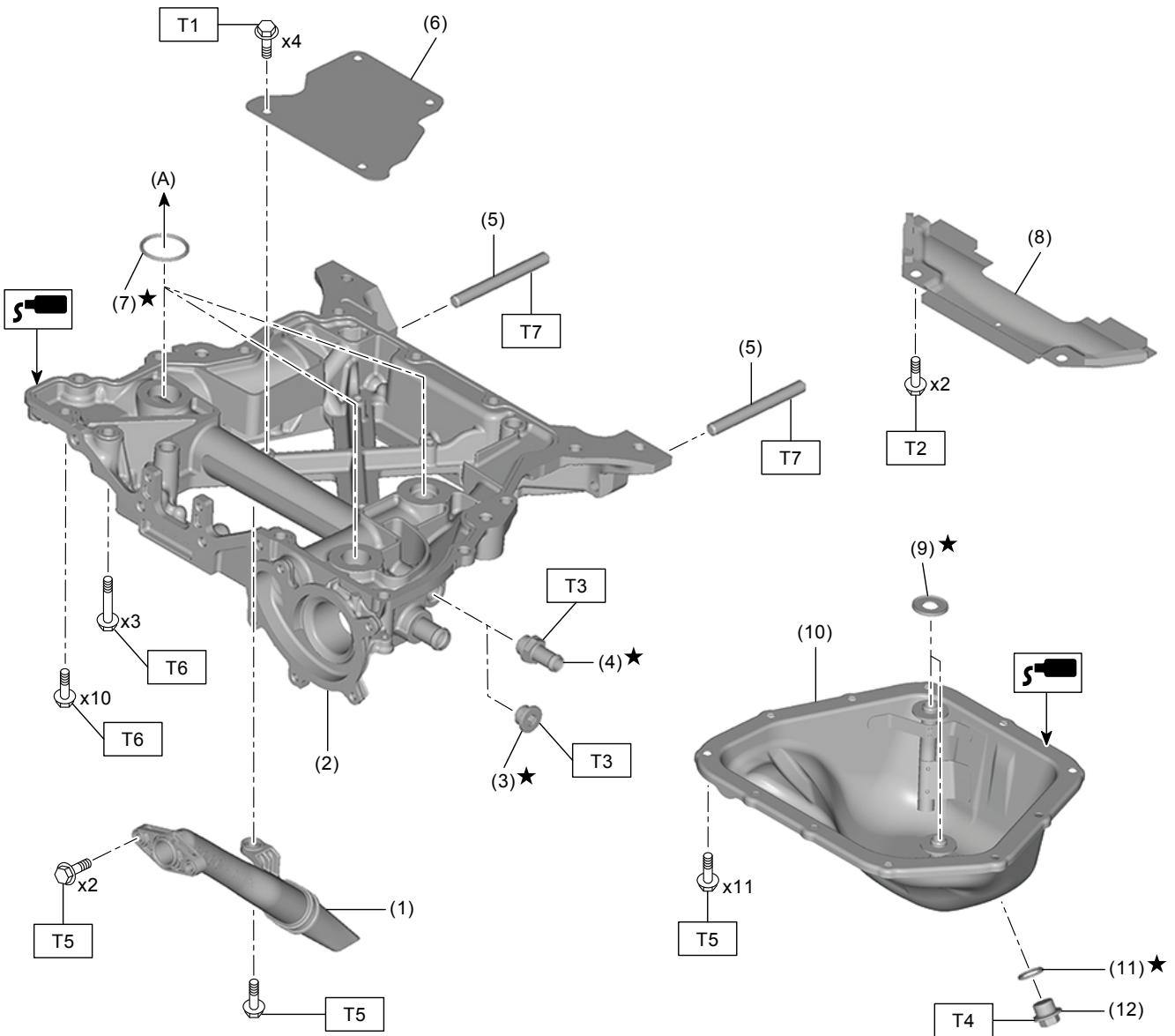
T3: 18 (1.8, 13.3)

T4: 45 (4.6, 33.2)

T5: Ref. to

LUBRICATION(H4DO)>Oil Filter>INSTALLATION.

3. OIL PAN



LU-10651

(A) To engine unit

- (1) Oil strainer
- (2) Oil pan upper
- (3) Plug (MT model)
- (4) Nipple (AT model)
- (5) Stud bolt
- (6) Baffle plate

- (7) O-ring
- (8) Housing cover
- (9) Gasket
- (10) Oil pan
- (11) Gasket
- (12) Drain plug

Tightening torque: N·m (kgf·m, ft-lb)

T1: 6.4 (0.7, 4.7)

T2: 12.4 (1.3, 9.1)

T3: 23 (2.3, 17.0)

T4: 41.7 (4.3, 30.8)

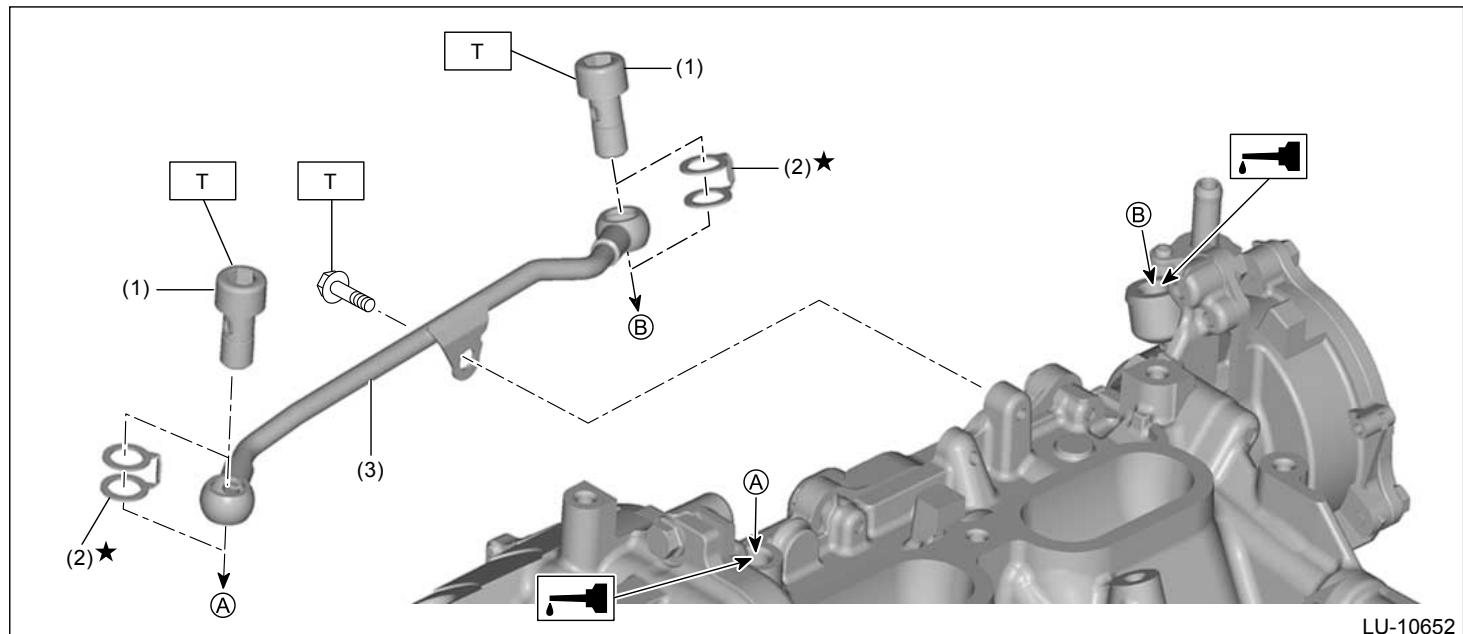
T5: [Ref. to](#)

[LUBRICATION\(H4DO\)>Oil Pan>INSTALLATION > OIL PAN.](#)

T6:  [Ref. to LUBRICATION\(H4DO\)>Oil Pan>INSTALLATION > OIL PAN UPPER.](#)

T7:  [Ref. to LUBRICATION\(H4DO\)>Oil Pan>ASSEMBLY > OIL PAN UPPER.](#)

4. OIL PIPE



(1) Union bolt

(3) Oil pipe

Tightening torque: N·m (kgf·m, ft-lb)

(2) Gasket

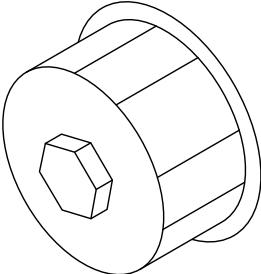
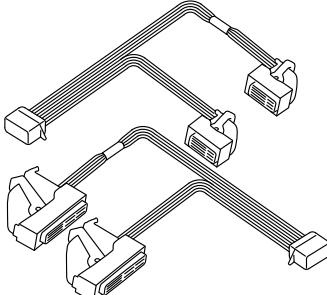
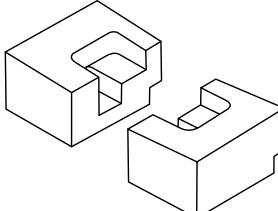
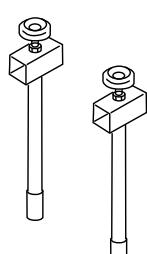
T:  [Ref. to LUBRICATION\(H4DO\)>Oil Pipe>INSTALLATION.](#)

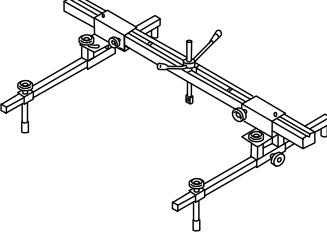
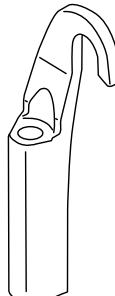
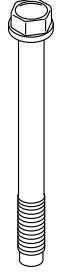
LUBRICATION(H4DO) > General Description

PREPARATION TOOL

1. SUBARU SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	498547000	OIL FILTER WRENCH	Used for removing and installing oil filter.

 ST-498547000			<p>Note:</p> <ul style="list-style-type: none"> • This tool is made by KYOTO TOOL CO., LTD. (KTC). Part No.: AVSA-079 • To make it easier to obtain, it has been specified as a special tool.
 ST18460AA180	18460AA180	CHECK BOARD	Used for measuring voltage and resistance of ECM terminals.
 ST18632AA020	18632AA020	STAND ASSY	Used for removing and installing oil pan.
 ST18679AA020	18679AA020	ADJUSTER	<ul style="list-style-type: none"> • Used for removing and installing oil pan. • Used together with ENGINE HANGER (99099AJ000).
	99099AJ000	ENGINE HANGER	<ul style="list-style-type: none"> • Used for removing and installing oil pan. • Used together with ADJUSTER (18679AA020).

			
ST99099AJ000			
	<u>12281-38150</u>	ENGINE HANGER NO.1	<ul style="list-style-type: none"> Used for removing and installing oil pan. Used together with BOLT (<u>90119-14120</u>).
	<u>90119-14120</u>	BOLT	<ul style="list-style-type: none"> Used for removing and installing oil pan. Used together with ENGINE HANGER NO.1 (<u>12281-38150</u>).
	—	SUBARU SELECT MONITOR 4	<p>Used for setting of each function and troubleshooting for electrical system.</p> <p>Note:</p> <ul style="list-style-type: none"> For detailed operation procedures, refer to "Help" of application. Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).
STSSM4			

2. OTHER

	REMARKS
Shackle	Used for removing and installing oil pan.

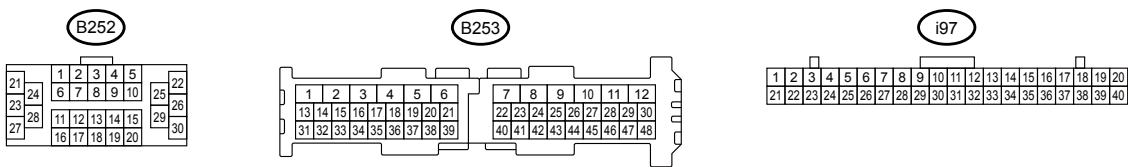
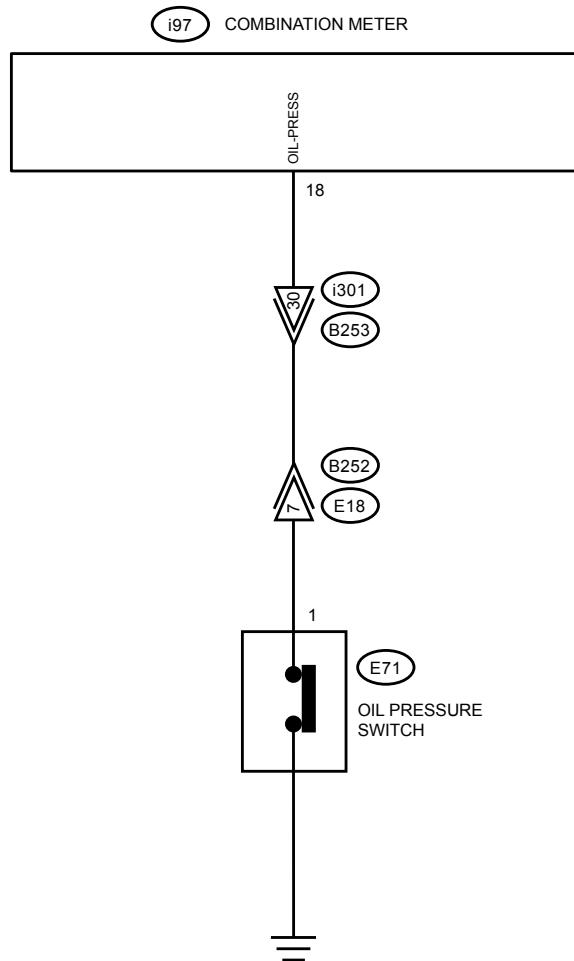
Note:

Load capacity: Use a shackle with a load capacity of 250 kg (551 lb) or more.

Oil pan seal cutter	Used for removing oil pan.
Circuit tester	Used for measuring resistance, voltage and current.

LUBRICATION(H4DO) > Oil Pressure System

WIRING DIAGRAM



LUBRICATION(H4DO) > Oil Pressure System

INSPECTION

INSPECTION WHEN OIL PRESSURE WARNING LIGHT IS ILLUMINATED

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read all DTCs.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed?

Yes

Perform the diagnosis for the displayed DTCs.

No

 [Go to 2.](#)

2. CHECK ENGINE OIL LEVEL.

Check the engine oil level.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>INSPECTION.](#)

Is engine oil level normal?

Yes

 [Go to 3.](#)

No

- (1) Adjust the engine oil level to a proper amount.
- (2)  [Go to 3.](#)

3. CHECK OIL PRESSURE WARNING LIGHT.

Start the engine, and check if the oil pressure warning light goes off.

Does the oil pressure warning light go off?

Yes

System is normal.

Restore the vehicle to its original state.

No

 [Go to 4.](#)

4. CHECK OIL PRESSURE SWITCH.



1. Turn the ignition switch to OFF.
2. Disconnect the ground terminal from battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
3. Disconnect the connector from oil pressure switch.
4. Connect the ground terminal to battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
5. Start the engine.
6. Check if the oil pressure warning light goes off.

Does the oil pressure warning light go off?

Yes

[Go to 6.](#)

No

[Go to 5.](#)

5. CHECK INSULATION OF HARNESS BETWEEN COMBINATION METER AND OIL PRESSURE SWITCH.



1. Turn the ignition switch to OFF.
2. Disconnect the ground terminal from battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
3. Disconnect the connector from the combination meter. [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.](#)
4. Check insulation of harness and chassis ground between combination meter and oil pressure switch.

Are they insulated?

Yes

(1) Replace the combination meter. [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)
(2) Restore the vehicle to its original state.

No

(1) Repair the harness between combination meter and oil pressure switch.
(2) Restore the vehicle to its original state.

6. CHECK OIL PRESSURE.



Check the engine oil pressure.  [Ref. to MECHANICAL\(H4DO\)>Engine Oil Pressure>INSPECTION.](#)

Is the oil pressure is normal?

Yes

- (1) Replace the oil pressure switch.  [Ref. to LUBRICATION\(H4DO\)>Oil Pressure Switch.](#)
- (2) Restore the vehicle to its original state.

No

Check the oil pump, oil filter and lubrication line, and repair or replace them if necessary.

LUBRICATION(H4DO) > Engine Oil

INSPECTION

Caution:

- **Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.**
- **If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.**

Preparation items:

Engine oil: Refer to "SPECIFICATION" for engine oil.  [Ref. to LUBRICATION\(H4DO\)>General Description>SPECIFICATION > ENGINE OIL.](#)

1. Park the vehicle on a level surface.
2. Pull out the oil level gauge, and wipe away the oil.
3. Insert the oil level gauge all the way.

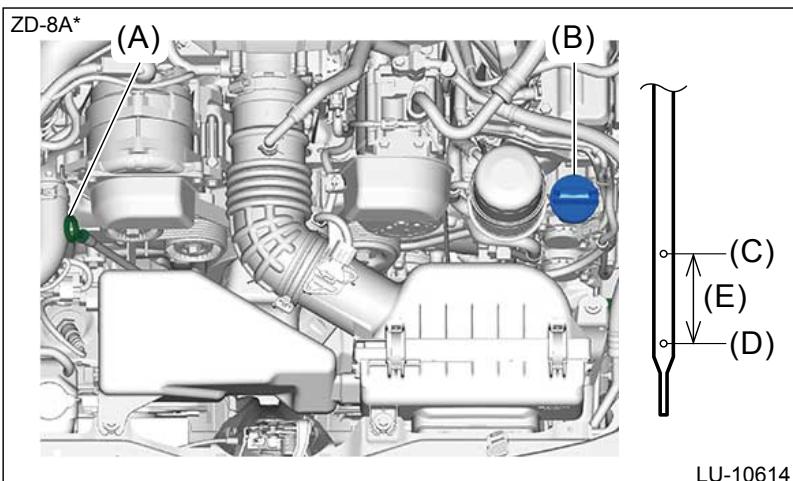
Note:

Be sure that the oil level gauge is correctly inserted and properly orientated.

4. Pull out the oil level gauge, and check both sides of the oil level gauge. Use a lower side to determine the engine oil level.
If the engine oil level is below the "L" line, check for oil leakage, and add oil up to the "F" line.
5. Start the engine, and confirm that the oil pressure warning light goes off.
6. After turning off the engine, wait for five minutes or more until the engine oil returns back to the oil pan, then check the oil level.

Note:

- **Be careful not to add oil above the "F" line when the engine is cold.**
- **As the oil level gauge is used for daily inspection, standard of "F" line and "L" line of the oil level gauge is set for the condition that engine is cold.**



(A) Oil level gauge

(C) "F" line

(E) Approx. 1.0 L (1.1 US qt, 0.9 Imp qt)

(B) Oil filler cap

(D) "L" line

LUBRICATION(H4DO) > Engine Oil

REPLACEMENT

Caution:

- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.

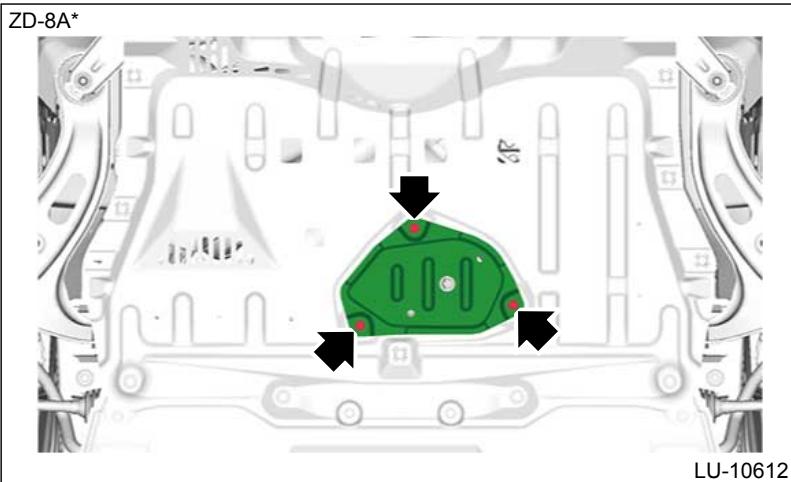
Preparation items:

Engine oil: Refer to "SPECIFICATION" for engine oil.  [Ref. to LUBRICATION\(H4DO\)>General Description>SPECIFICATION > ENGINE OIL.](#)

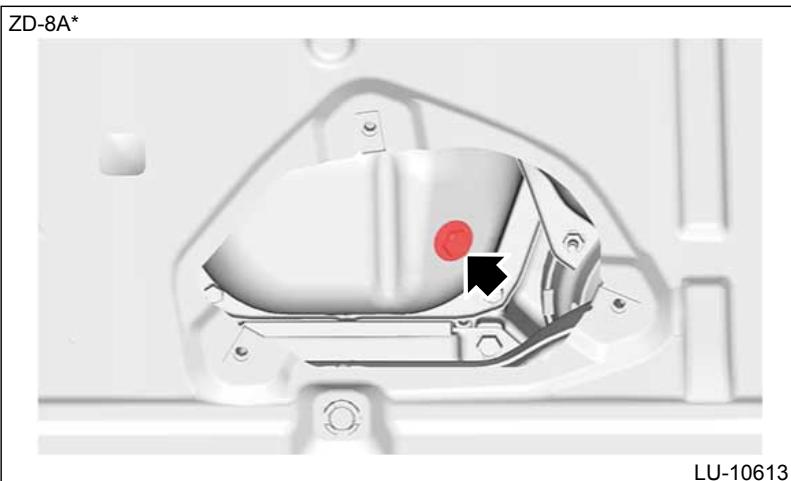
Engine oil capacity:

Refer to "SPECIFICATION" for engine oil capacity.  [Ref. to LUBRICATION\(H4DO\)>General Description>SPECIFICATION > ENGINE OIL.](#)

1. Remove the oil filler cap.
2. Remove the oil drain cover from the under cover.



3. Drain engine oil by loosening the drain plug.



4. Install the drain plug using a new gasket.

Caution:

An old gasket may be adhered to the drain plug, so be sure to check the plug.

Tightening torque:

41.7 N·m (4.3 kgf-m, 30.8 ft-lb)

5. Install the oil drain cover to the under cover.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

6. Add engine oil up to the "F" line on oil level gauge.
7. Install the oil filler cap.
8. Check the engine oil level.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>INSPECTION.](#)

LUBRICATION(H4DO) > Oil Level Gauge

REMOVAL



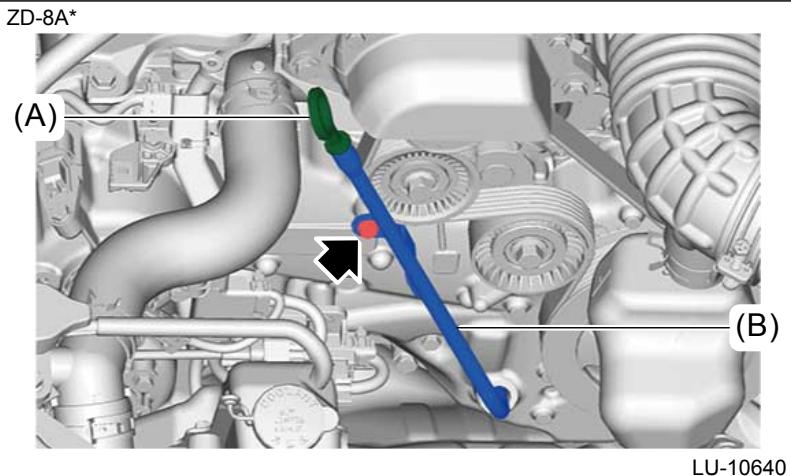
Caution:

- **Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.**
- **If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.**

1. Disconnect the ground terminal from battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
2. Remove the air cleaner case. [Ref. to INTAKE \(INDUCTION\)\(H4DO\)>Air Cleaner Case>REMOVAL.](#)
3. Pull out the oil level gauge (A), and remove the oil level gauge guide (B).

Caution:

Prepare cloth, etc. to prevent the engine oil from splashing.



4. Remove the O-ring from the oil level gauge guide.

LUBRICATION(H4DO) > Oil Level Gauge

INSTALLATION

1. Install a new O-ring to the oil level gauge guide.

Note:

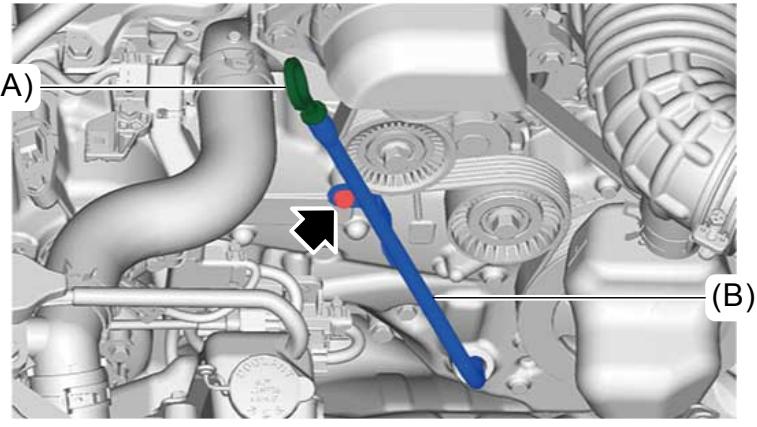
Apply a coat of engine oil to the O-rings.

2. Install the oil level gauge guide (B), and insert the oil level gauge (A).

Tightening torque:

6.4 N.m (0.7 kgf-m, 4.7 ft-lb)

ZD-8A*



3. Install the air cleaner case. [Ref. to INTAKE \(INDUCTION\)\(H4DO\)>Air Cleaner Case>INSTALLATION.](#)
4. Connect the ground terminal to battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
5. Check the engine oil level and replenish the engine oil if necessary. [Ref. to LUBRICATION\(H4DO\)>Engine Oil>INSPECTION.](#)

LUBRICATION(H4DO) > Oil Level Gauge

INSPECTION

1. Check for oil leaks.
2. Check that there is no deformation, cracks or other damages.
3. Check the oil level gauge guide for foreign matter or clogging.

LUBRICATION(H4DO) > Oil Filter

REMOVAL



Caution:

- **Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.**
- **If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.**

1. Remove the oil filter.

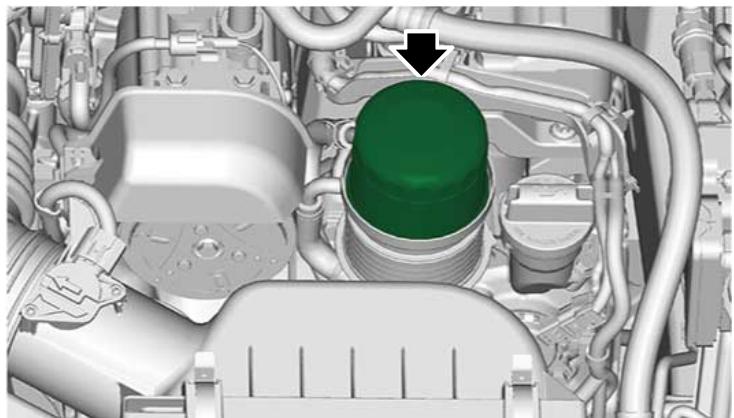
Note:

If there is water or dust on the oil filter installation portion, clean it before removing the oil filter.

Preparation tool:

ST: OIL FILTER WRENCH (498547000)

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LUBRICATION(H4DO) > Oil Filter

INSTALLATION

Caution:

Do not tighten excessively, or engine oil may leak.

1. Clean the oil filter installation surface.
2. Obtain a new oil filter and apply a thin coat of engine oil to the seal rubber.
3. Install the oil filter by turning it by hand, being careful not to damage the seal rubber of the oil filter.
4. Further tighten the oil filter (approx. 3/4 rotation) after the seal rubber of the oil filter comes in contact with the installation surface.

When using a torque wrench, use the oil filter wrench for tightening.

Caution:

If there is oil oozing on the installation surface after installation, wipe it off.

Preparation tool:

ST: OIL FILTER WRENCH (498547000)

Tightening torque:

14 N·m (1.4 kgf-m, 10.3 ft-lb)

5. Check the engine oil level and replenish the engine oil if necessary.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>INSPECTION.](#)

LUBRICATION(H4DO) > Oil Filter

INSPECTION

1. Check for oil leaks.
2. Check that there is no deformation, cracks or other damages.
3. Check the oil passages for clogging.

LUBRICATION(H4DO) > Oil Pump

SPECIFICATION

Oil pump is integrated with the chain cover.

Refer to "Chain Cover" for removal and installation procedures.

-  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>REMOVAL.](#)
-  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSTALLATION.](#)

LUBRICATION(H4DO) > Oil Pan

REMOVAL



Caution:

- **Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.**
- **If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.**

1. OIL PAN

1. Fully open the panel COMPL front hood. [Ref. to REPAIR CONTENTS>NOTE > STAY ASSEMBLY FRONT HOOD.](#)
2. Disconnect the ground terminal from battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
3. Perform the steps below to remove the air intake boot, and place it aside so that it does not interfere with the work.

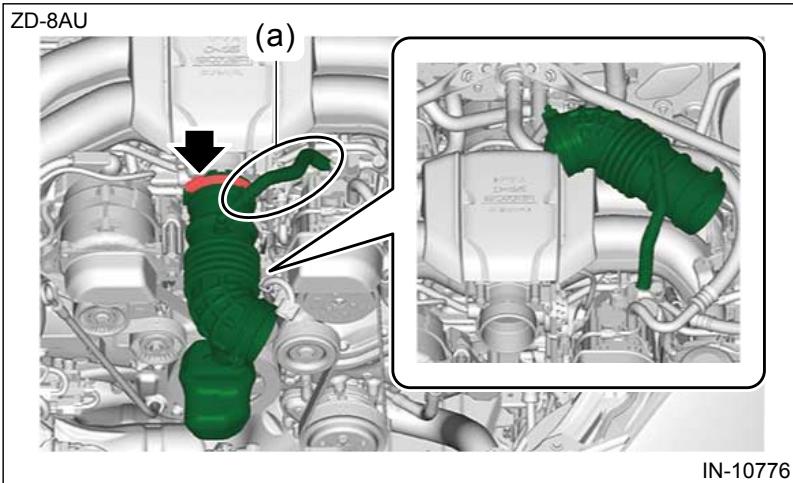
Caution:

Do not disconnect the PCV hose No. 2 (a).

- (1) Remove the air cleaner case. [Ref. to INTAKE \(INDUCTION\)\(H4DO\)>Air Cleaner Case>REMOVAL.](#)
- (2) Loosen the clamp, remove the air intake boot, and place it aside so that it does not interfere with the work.

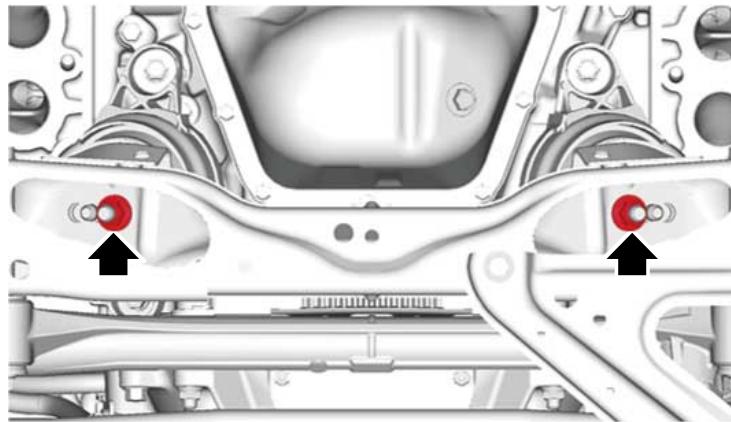
Caution:

Be careful not to pull out the PCV hose No. 2 (a).



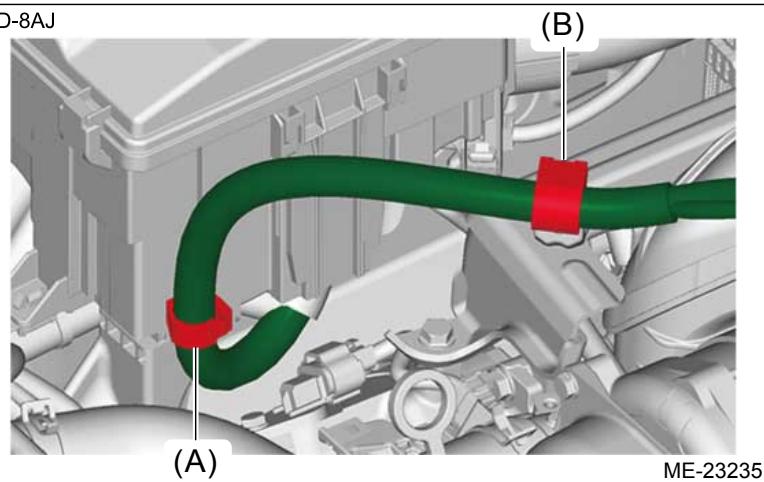
4. Remove the ECM. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\)>REMOVAL.](#)
5. Drain the engine oil. [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)
6. Remove the front exhaust pipe. [Ref. to EXHAUST\(H4DO\)>Front Exhaust Pipe>REMOVAL.](#)
7. Remove the nuts which secure the engine mounting to the crossmember COMPL front.

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8. Open the claw of the clip (A) which secures the generator cord to the main fuse box and remove the generator cord.
9. Remove the clip (B) securing the generator cord to the fuel pipe protector RH No. 1.

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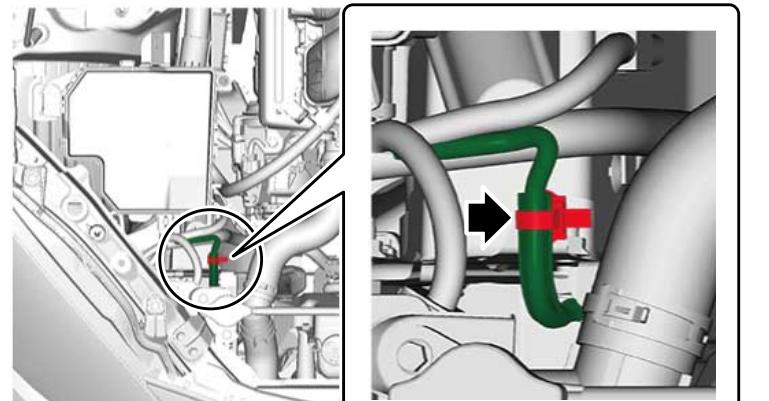
10. Remove the clip securing the bulkhead wiring harness to the vehicle.

Note:

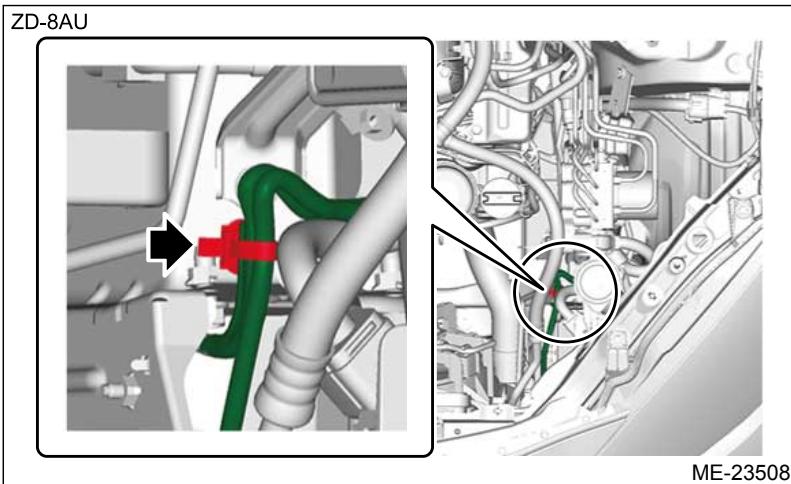
This procedure is required to prevent the bulkhead wiring harness from being damaged by the adjuster (ST).

- RH side

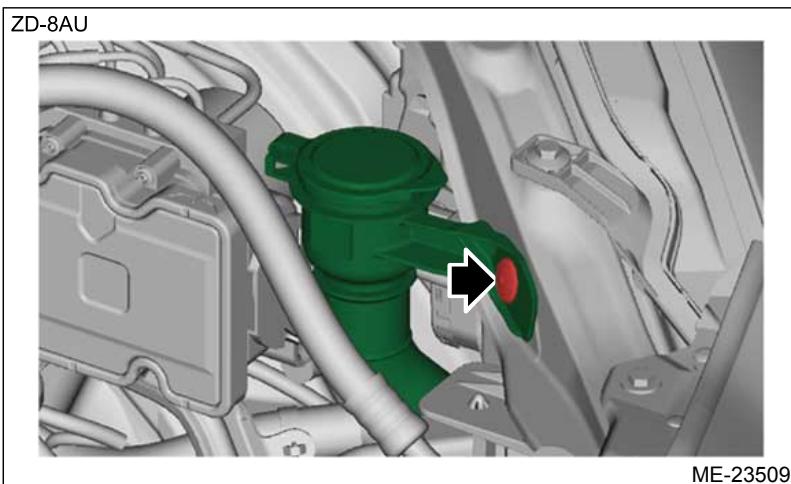
ZD-8AU



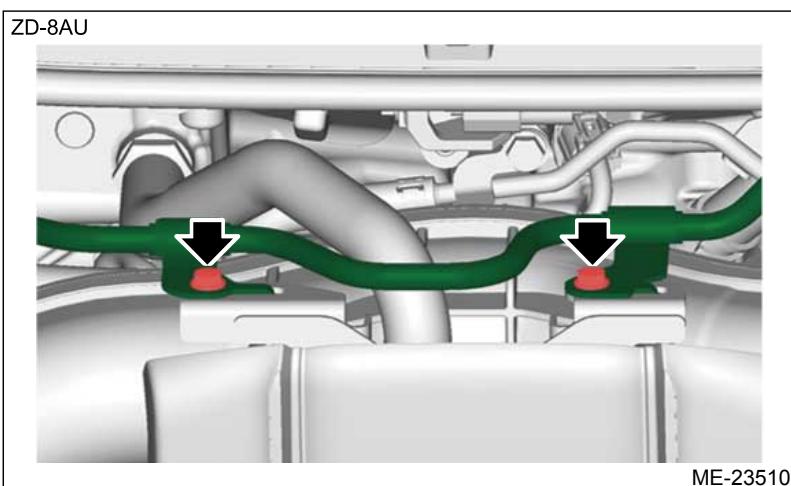
- LH side



11. Remove the clip securing the hose inlet assembly to the vehicle.

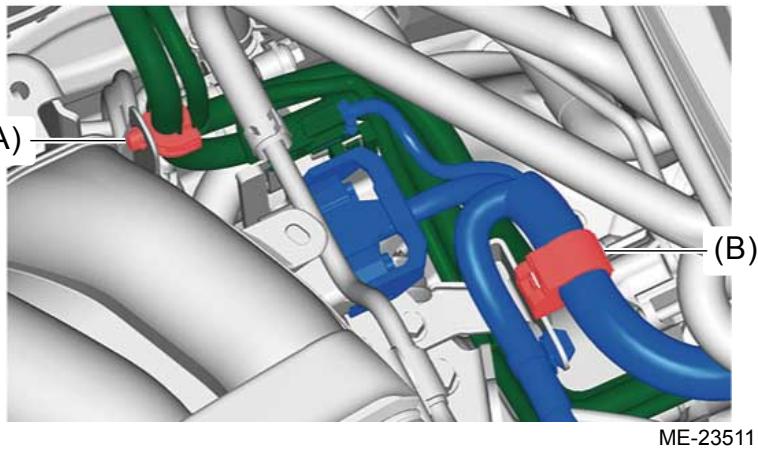


12. Remove the bolts which secure the brake vacuum pipe to the collector cover bracket No. 2.



13. Remove the clip (A) which secures the battery cable assembly to the intake manifold assembly, and remove the clip (B) which secures the bulkhead wiring harness to the engine rear hanger.

ZD-8AU



14. Lift the engine using the ST1, ST2, ST3, ST4, and the shackle, and install the ST5.

(1) Using the ST1, install the ST2 to the engine unit.

Preparation tool:

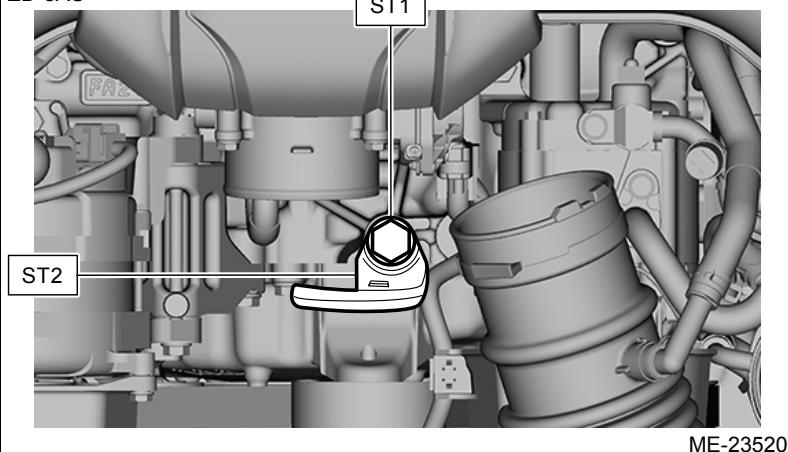
ST1: BOLT ([90119-14120](#))

ST2: ENGINE HANGER NO.1 ([12281-38150](#))

Tightening torque:

43 N·m (4.4 kgf-m, 31.7 ft-lb)

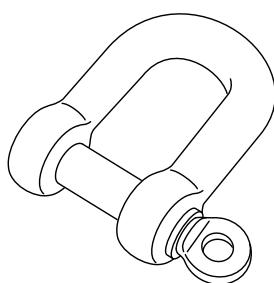
ZD-8AU



(2) Set the ST3, ST4, and the shackle to the vehicle.

Caution:

- Use a shackle with the load capacity of 250 kg (551 lb) or more.



FS-00325

- Set the ST3, ST4, and the shackle at the locations shown in the figure.

Preparation tool:

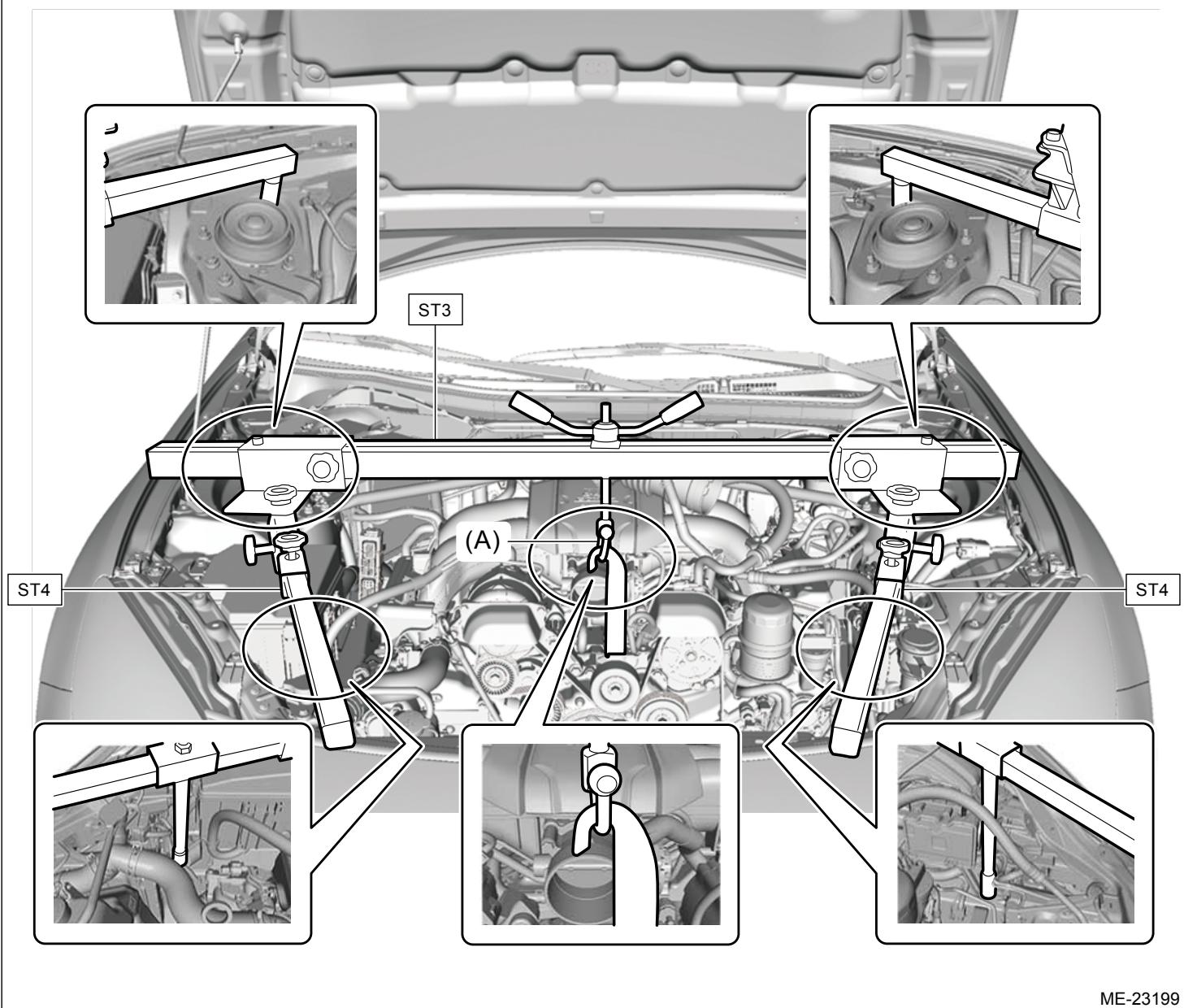
ST3: ENGINE HANGER (99099AJ000)

ST4: ADJUSTER (18679AA020)

General tool:

Shackle

ZD-8AU



ME-23199

(A) Shackle

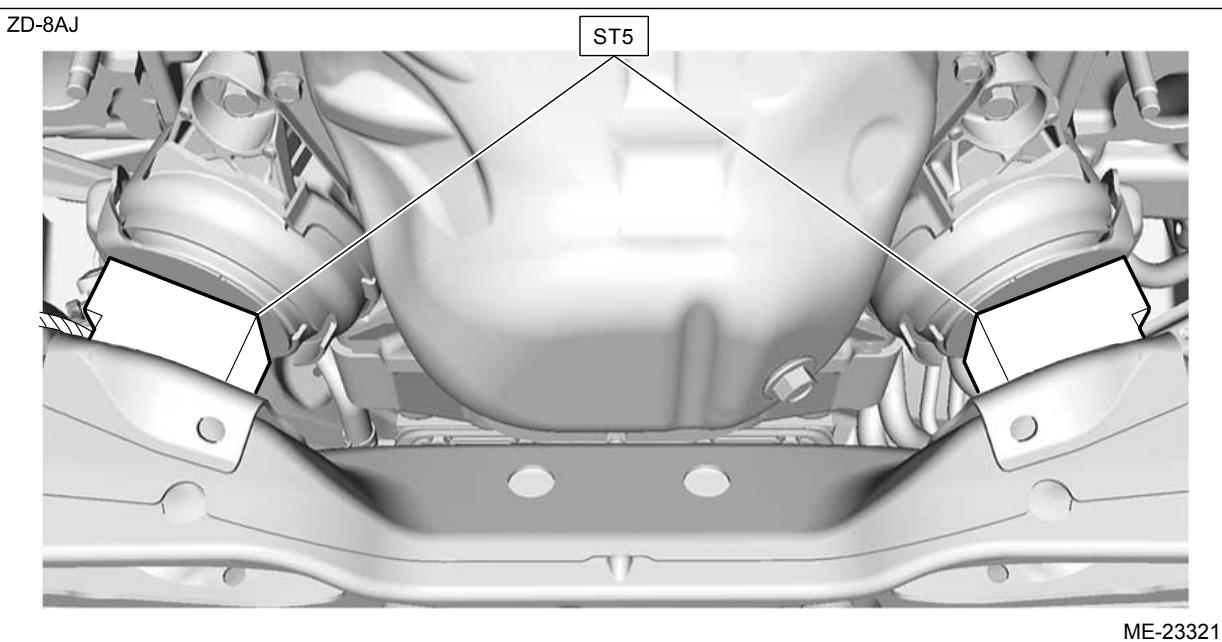
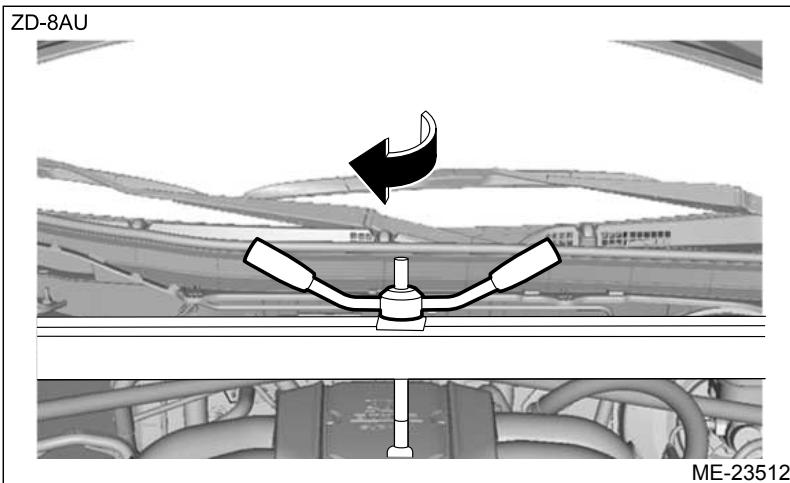
- (3) Turn the handle clockwise to lift the engine gradually and set the ST5 between the engine mounting and crossmember COMPL front.

Caution:

- To prevent damage to the threaded portion of the handle, apply grease or lubricants to the threaded portion before starting the work.
- When lifting up the engine unit, pay attention to the clearance of each part and be careful not to lift the engine too much, in order to prevent damaging the vehicle.
- When the engine unit is lifted, #4 part of the intake manifold assembly and hose pressure suction contact lightly. Insert a cloth, etc. between #4 part of the intake manifold assembly and hose pressure suction for protection.

Preparation tool:

ST5: STAND ASSY (18632AA020)

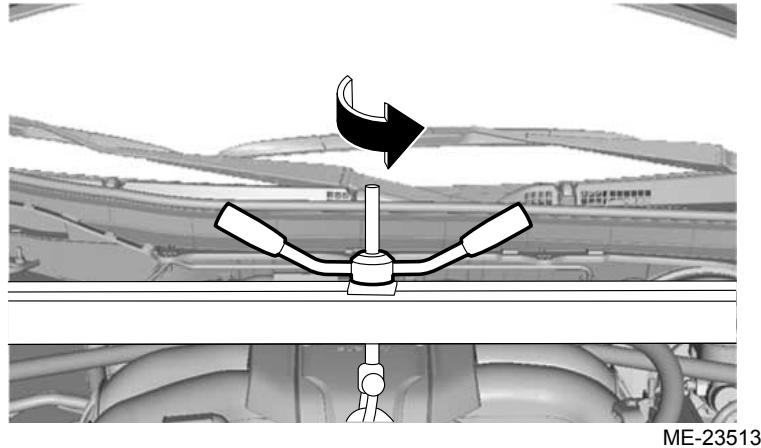


- (4) Turn the handle counterclockwise to lower the engine gradually and remove the ST3, ST4, and the shackle.

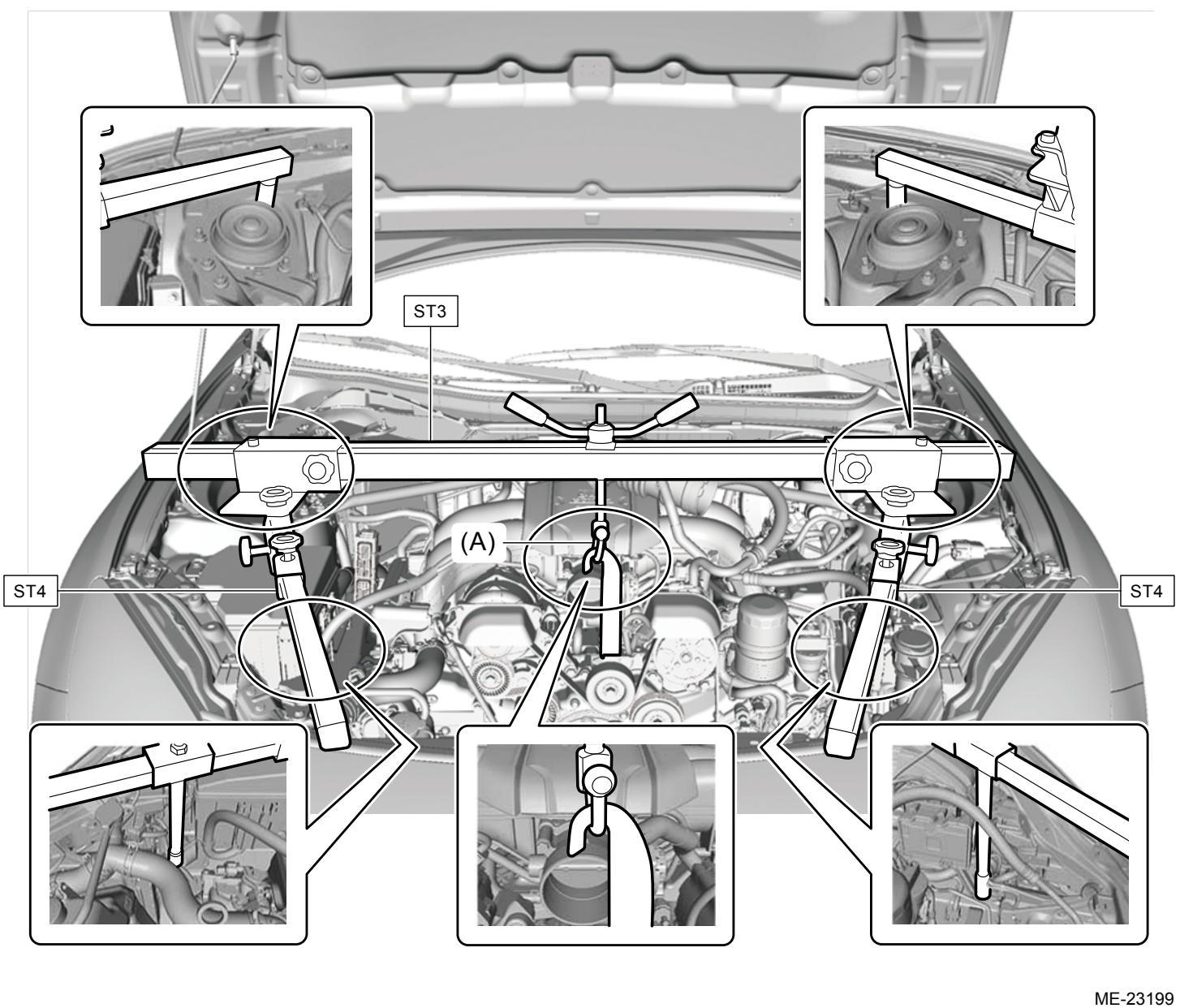
Caution:

After lowering the engine, rock the engine to check that the ST5 does not come off.

ZD-8AU

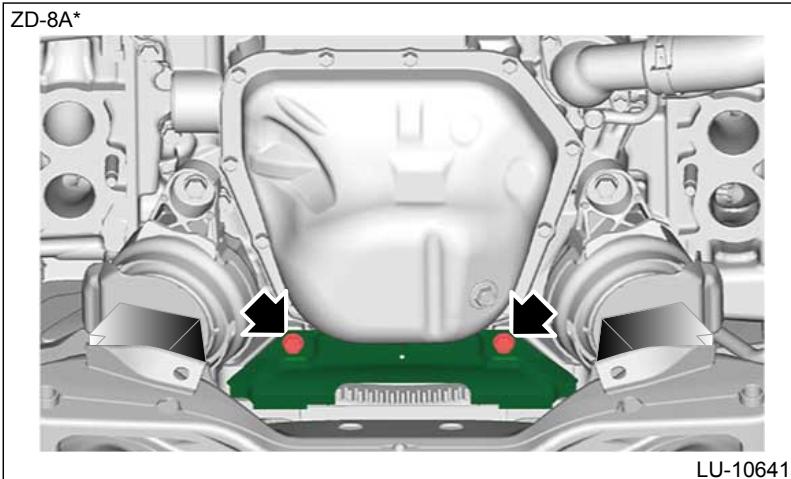


ZD-8AU

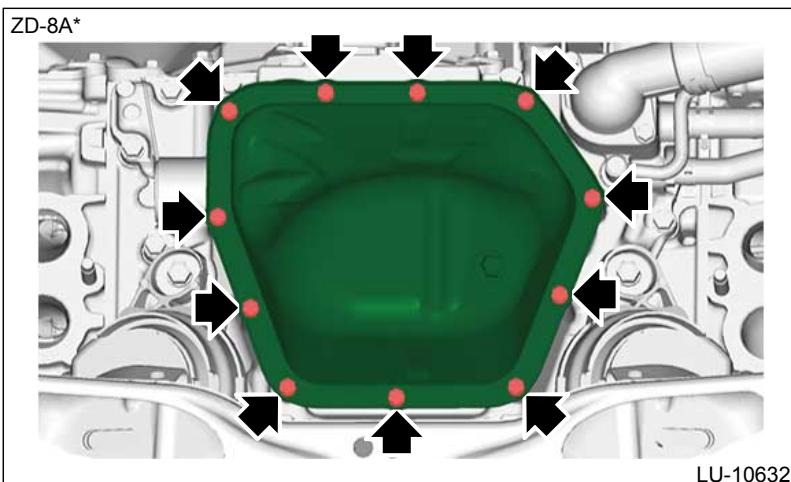


(A) Shackle

15. Remove the housing cover.



16. Remove the bolts which hold the oil pan.



17. Insert an oil pan seal cutter into the gap between oil pan and oil pan upper, and remove the oil pan.

Caution:

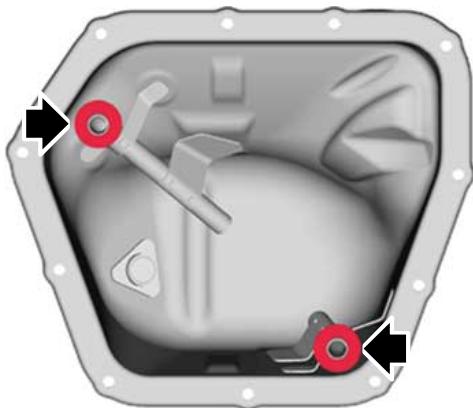
- Use a container or cloth to catch the engine oil in order to prevent it from splashing.
- Do not use the tools other than the oil pan seal cutter, in order to prevent damaging the oil pan and oil pan upper.
- Do not twist with excessive force. The oil pan may be deformed.

Note:

When removing, open the front side of the oil pan first, in order to avoid the interference with the oil strainer.

18. Remove the gasket from the oil pan.

ZD-8A*



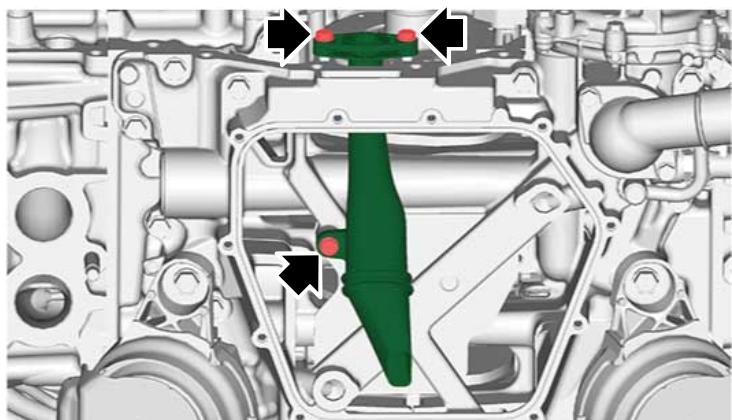
LU-10634

19. Remove the liquid gasket from the oil pan and the oil pan upper.

20. When removing the oil strainer

- (1) Remove the chain cover. [Ref. to MECHANICAL\(H4DO\)>Chain Cover>REMOVAL.](#)
- (2) Remove the oil strainer.

ZD-8A*

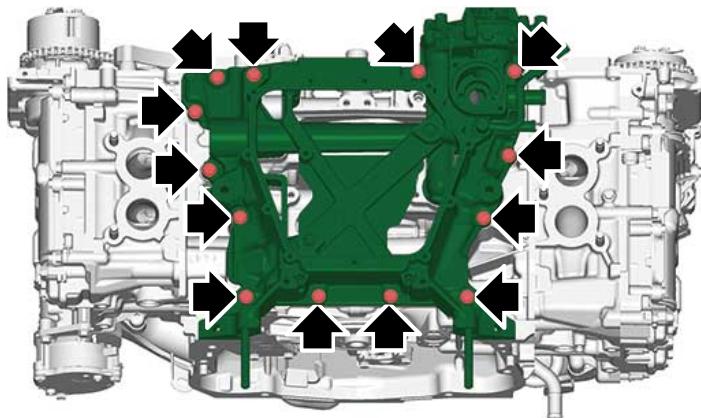


LU-10635

2. OIL PAN UPPER

1. Remove the engine assembly. [Ref. to MECHANICAL\(H4DO\)>Engine Assembly>REMOVAL.](#)
2. Remove the water pipe. [Ref. to COOLING\(H4DO\)>Water Pipe>REMOVAL > WATER PIPE.](#)
3. Remove the thermostat. [Ref. to COOLING\(H4DO\)>Thermostat>REMOVAL > ENGINE SIDE.](#)
4. Remove the oil pan and oil strainer. [Ref. to LUBRICATION\(H4DO\)>Oil Pan>REMOVAL > OIL PAN.](#)
5. Remove the oil pan upper from the cylinder block.
 - (1) Remove the bolts which hold the oil pan upper.

ZD-8A*



LU-10624

- (2) Insert the bolt (B) into the portion (A) of the oil pan upper, and screw the bolt in evenly at both sides until the clearance "C" between the oil pan upper and cylinder block is 4 mm (0.1575 in).

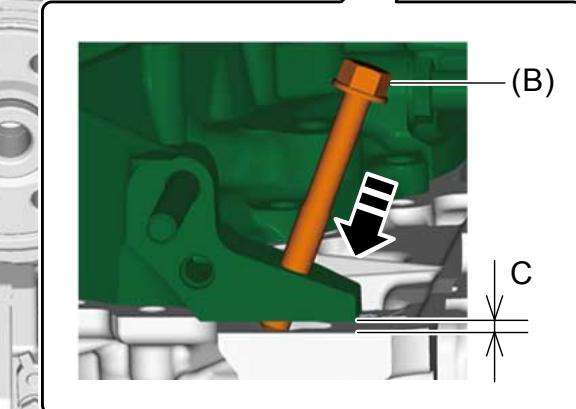
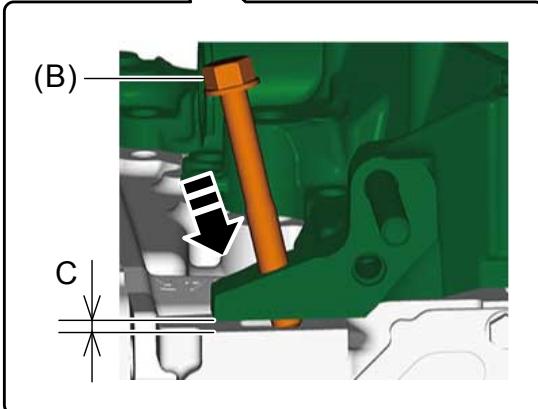
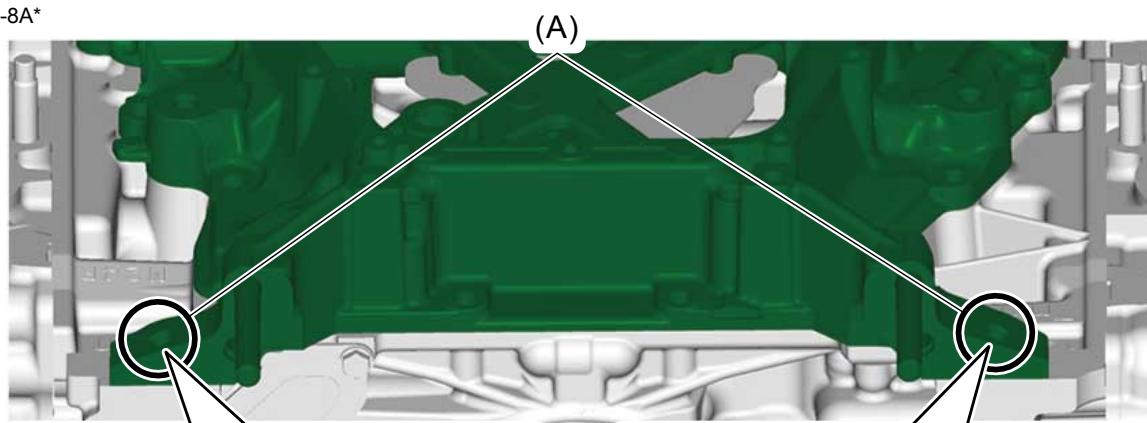
Caution:

To prevent damage to the knock pin boss, make sure that the clearance "C" is within the specified value.

Note:

For the bolt (B), use the bolt for connecting the engine unit and transmission body.

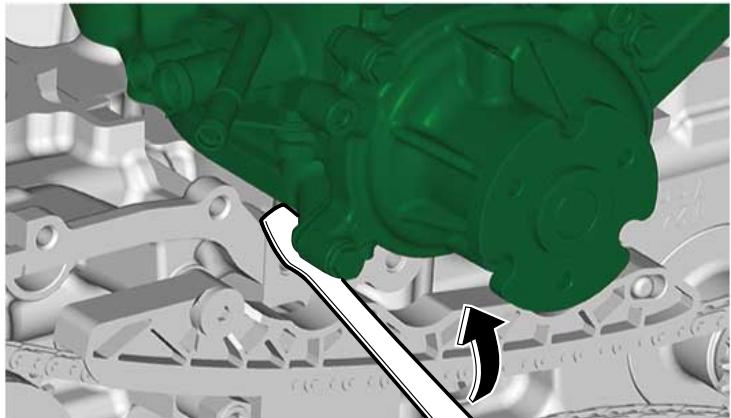
ZD-8A*



LU-10648

- (3) Pry the points shown in the figure with a crowbar wrapped by protective tape, and then remove the oil pan upper.

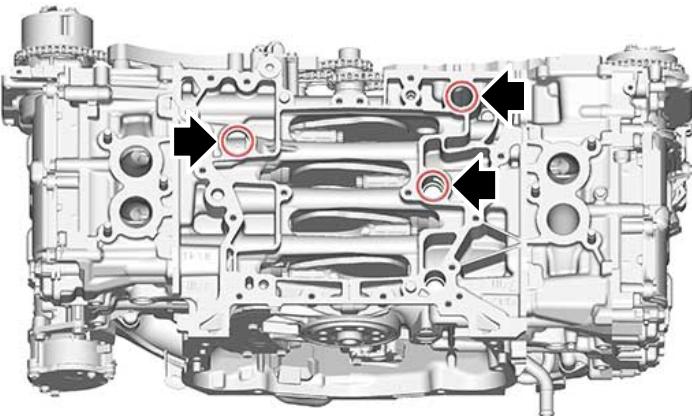
ZD-8A*



LU-10649

6. Remove the O-ring from the cylinder block.

ZD-8A*



LU-10626

7. Remove the liquid gasket from oil pan upper and cylinder block.

LUBRICATION(H4DO) > Oil Pan

INSTALLATION

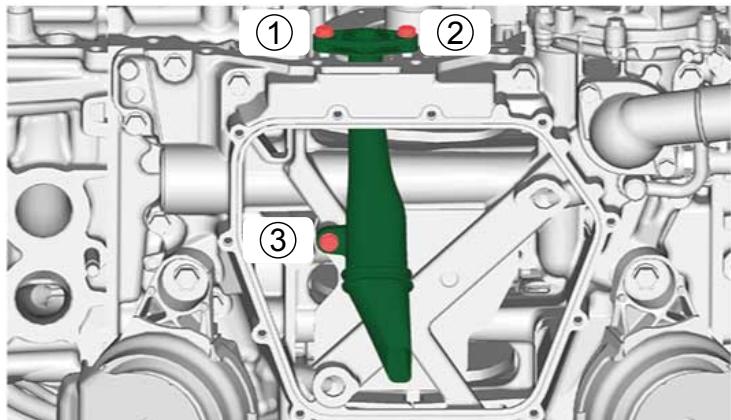
1. OIL PAN

1. When removing the oil strainer
 - (1) Temporarily install the oil strainer.
 - (2) Tighten the bolts in the numerical order as shown in the figure.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

ZD-8A*

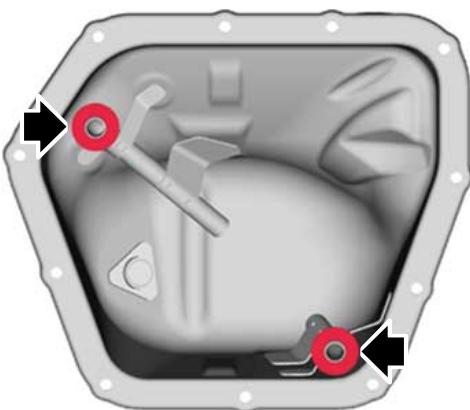


LU-10636

(3) Install the chain cover. [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSTALLATION.](#)

2. Install a new gasket to the oil pan.

ZD-8A*



LU-10634

3. Apply liquid gasket to the mating surface of the oil pan as shown in the figure, and install the oil pan.

Note:

- Before applying liquid gasket, degrease the old liquid gasket seal surface of the oil pan and the oil pan upper.
- Install within 5 min. after applying liquid gasket.

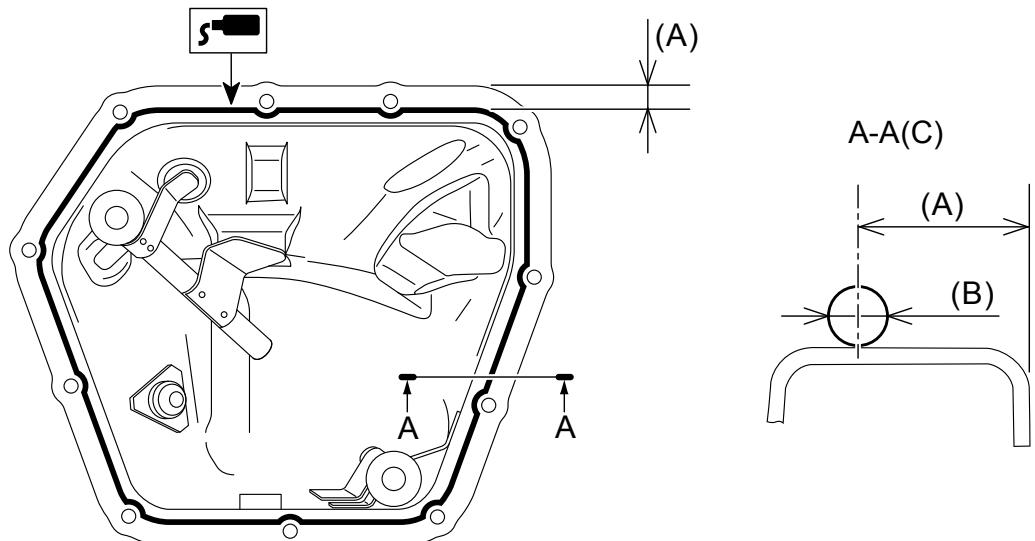
Preparation items:

Liquid gasket: THREE BOND 1217G (part No. K0877Y0100), THREE BOND 1217H or equivalent

Liquid gasket applying diameter:

4.5 ±0.5 mm (0.1772±0.0197 in)

ZD-8A*



LU-10645

(A) 10.5 mm (0.4134 in) or
more, 13.5 mm (0.5315 in)
or less

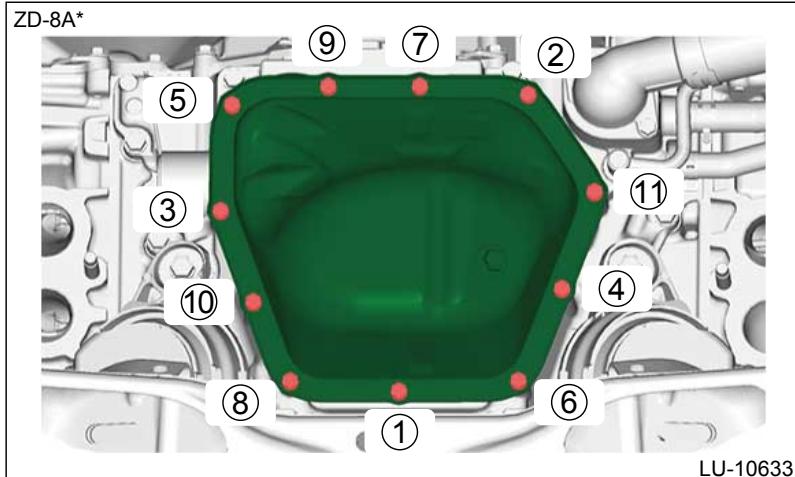
(B) $\varnothing 4.5 \pm 0.5$ mm
(0.1772 ± 0.0197 in)

(C) Liquid gasket applying
position

4. Tighten the bolts in the numerical order as shown in the figure.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



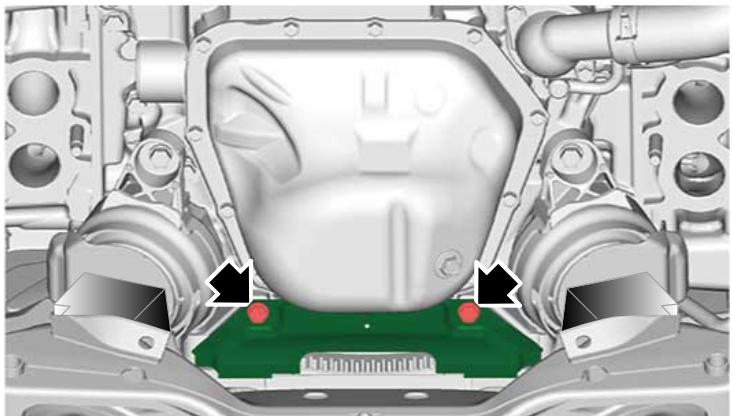
LU-10633

5. Install the housing cover.

Tightening torque:

12.4 N·m (1.3 kgf-m, 9.1 ft-lb)

ZD-8A*



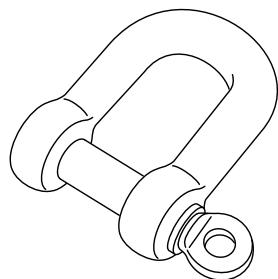
LU-10641

6. Lift the engine using the ST1, ST2, ST3, ST4 and the shackle, and remove the ST5.

- (1) Set the ST3, ST4, and the shackle to the vehicle.

Caution:

- Use a shackle with the load capacity of 250 kg (551 lb) or more.



FS-00325

- Set the ST3, ST4, and the shackle at the locations shown in the figure.

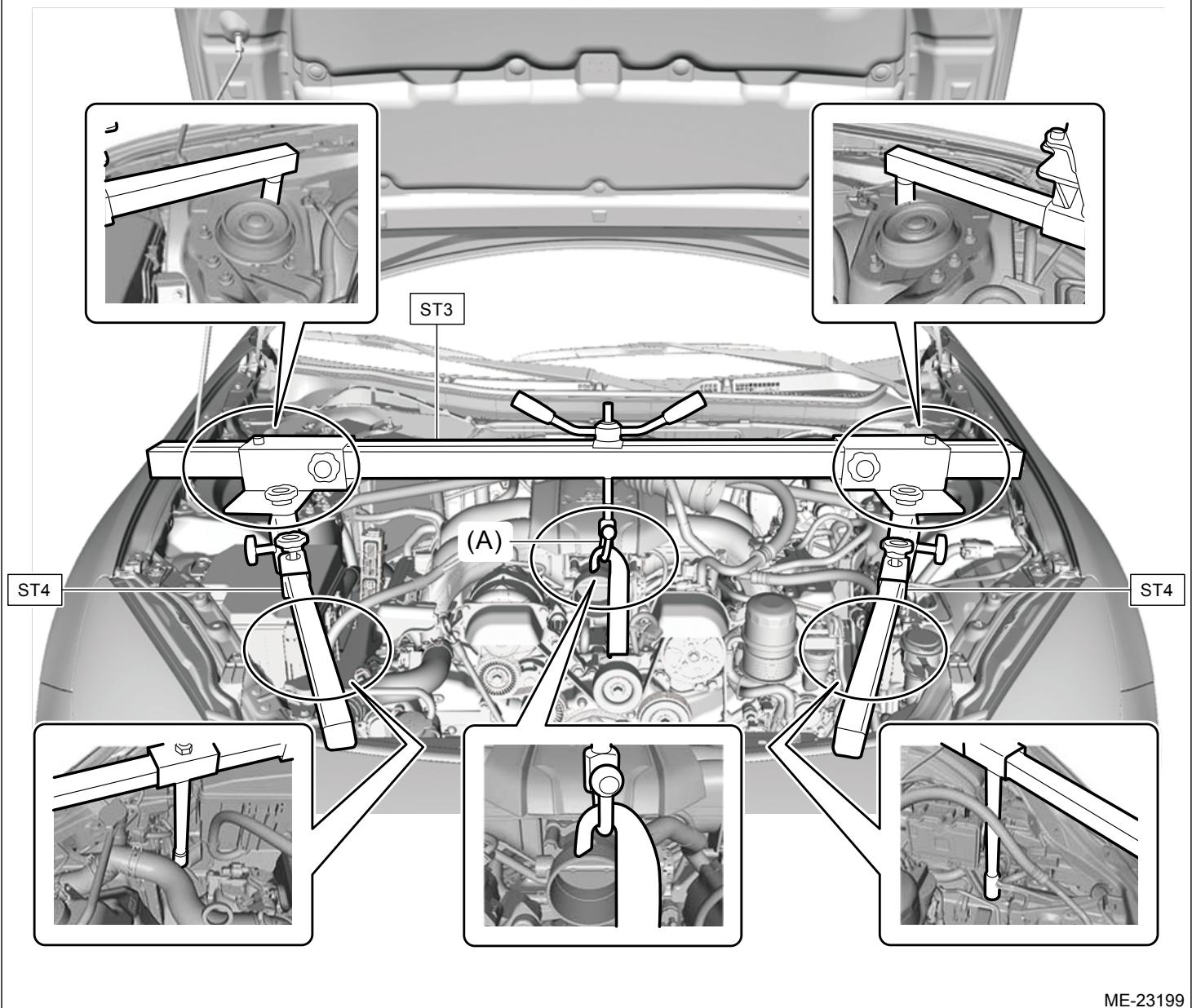
Preparation tool:

ST3: ENGINE HANGER (99099AJ000)

ST4: ADJUSTER (18679AA020)

General tool:

Shackle



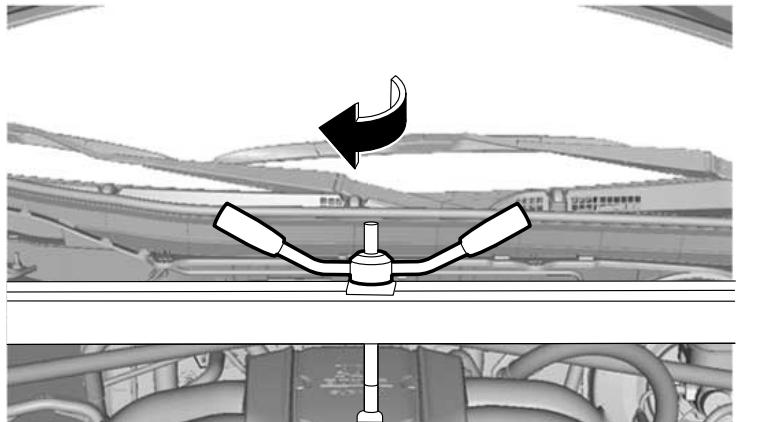
(A) Shackle

(2) Turn the handle clockwise to lift the engine gradually and remove the ST5.

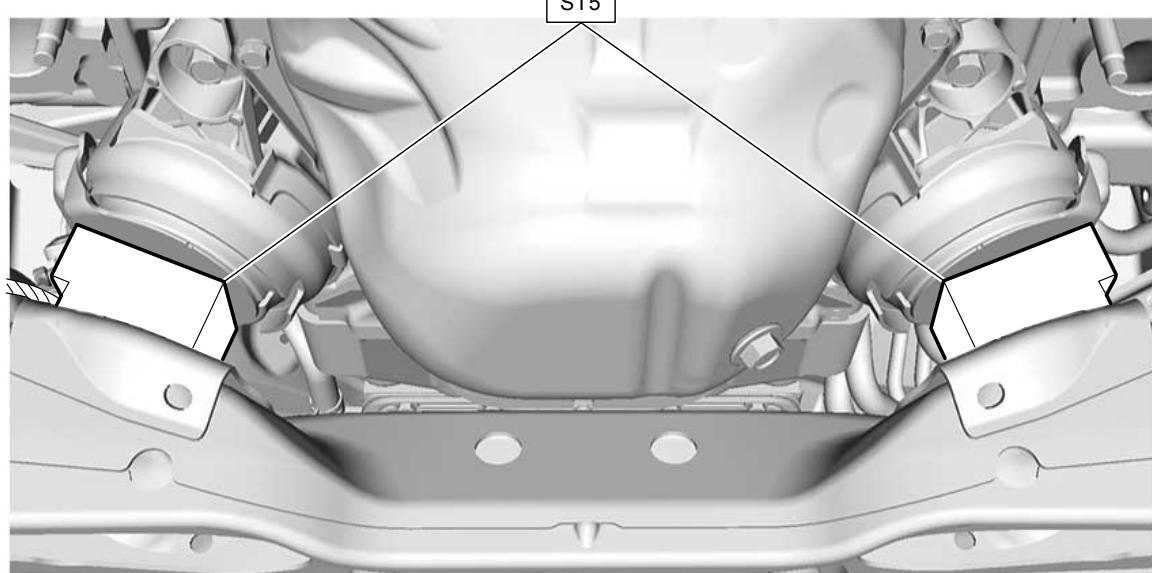
Caution:

- To prevent damage to the threaded portion of the handle, apply grease or lubricants to the threaded portion before starting the work.
- When lifting up the engine unit, pay attention to the clearance of each part and be careful not to lift the engine too much, in order to prevent damaging the vehicle.

ZD-8AU



ZD-8AJ

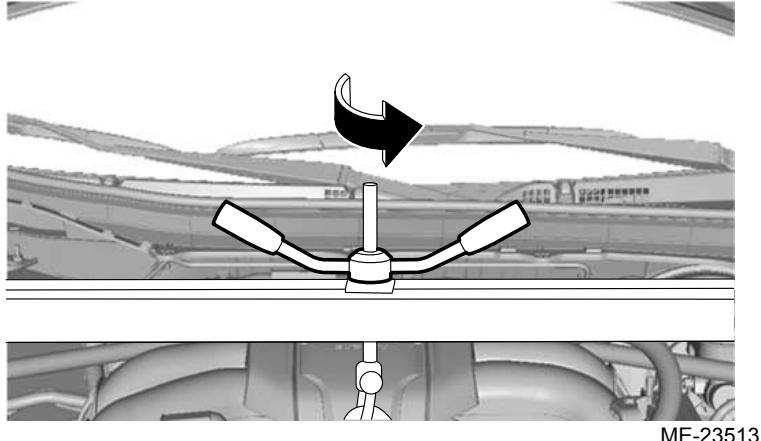


- (3) Turn the handle counterclockwise to lower the engine gradually and insert the stud bolt of the engine mounting into the engine mounting hole of the crossmember COMPL front.

Note:

- If it is hard to insert the stud bolt of the engine mounting into the engine mounting hole of the crossmember COMPL front, lower the engine while lightly pushing it toward the rear of the vehicle.
- Check that the stud bolt of the engine mounting is securely inserted into the engine mounting hole of the crossmember COMPL front.

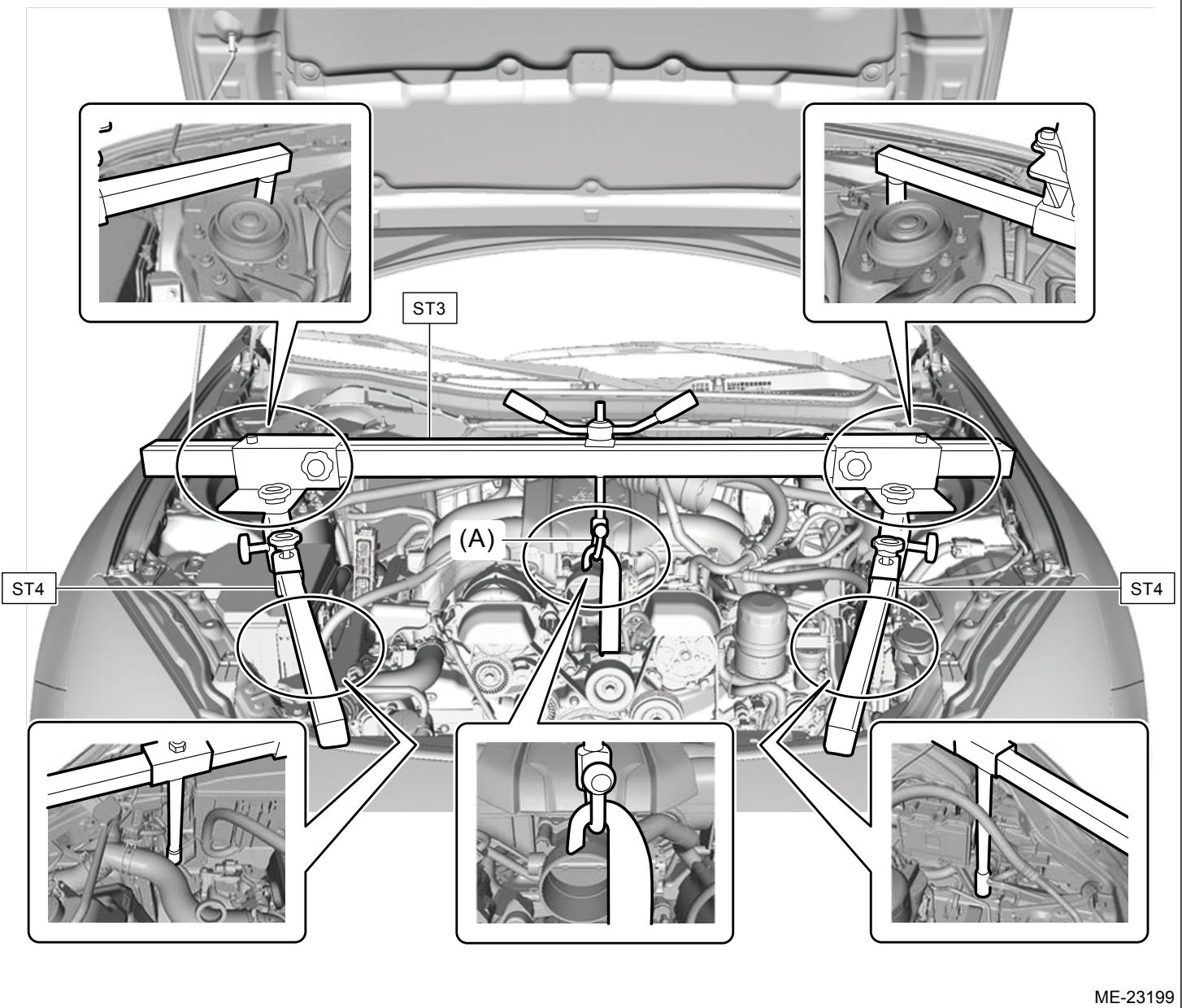
ZD-8AU



ME-23513

(4) Remove the ST3, ST4, and the shackle from the vehicle.

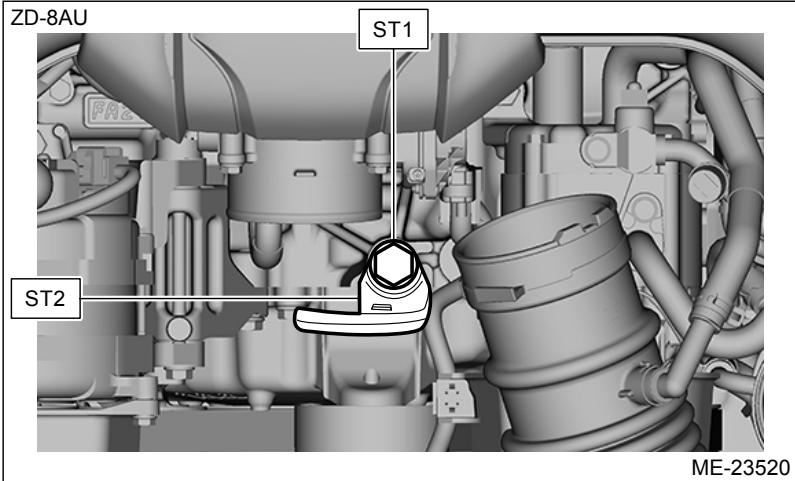
ZD-8AU



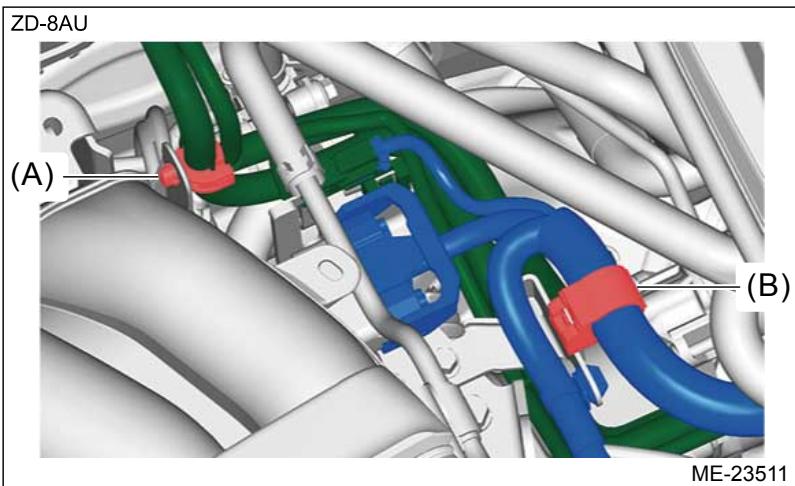
ME-23199

(A) Shackle

(5) Remove the ST1 and ST2.



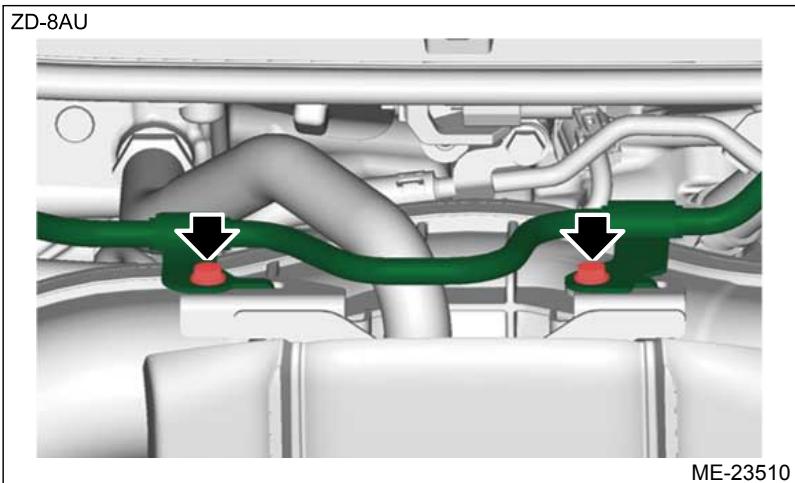
7. Secure the bulkhead wiring harness to the engine rear hanger with clip (B), and secure the battery cable assembly to the intake manifold assembly with clip (A).



8. Install the bolts which secure the brake vacuum pipe to the collector cover bracket No. 2.

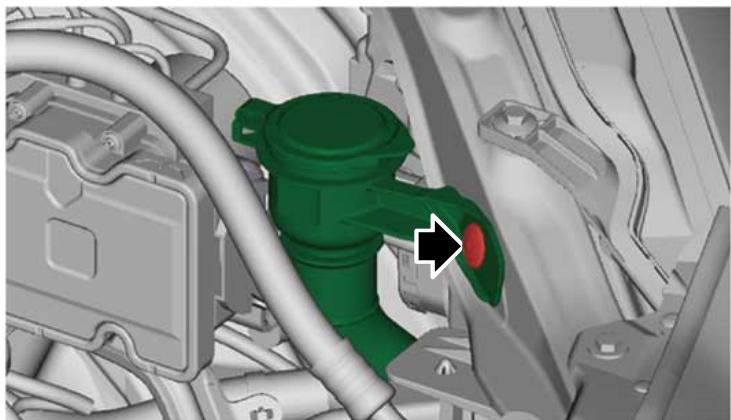
Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)



9. Secure the hose inlet assembly to the vehicle with the clip.

ZD-8AU

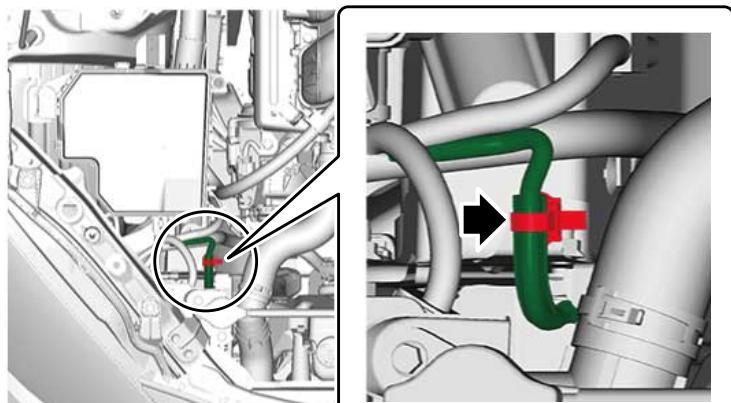


ME-23509

10. Secure the bulkhead wiring harness to the vehicle with the clip.

- RH side

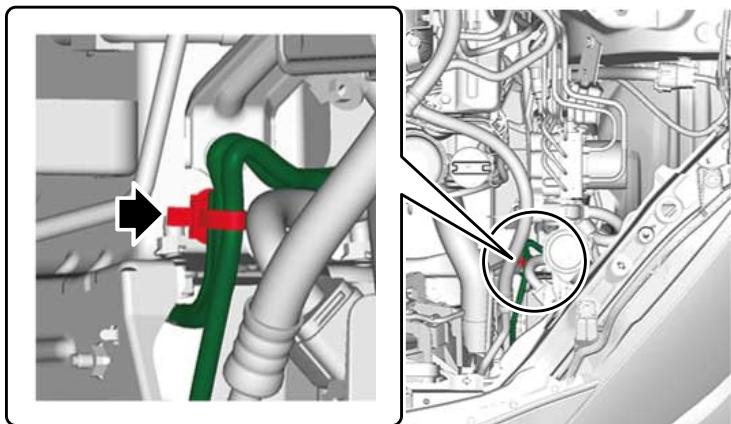
ZD-8AU



ME-23507

- LH side

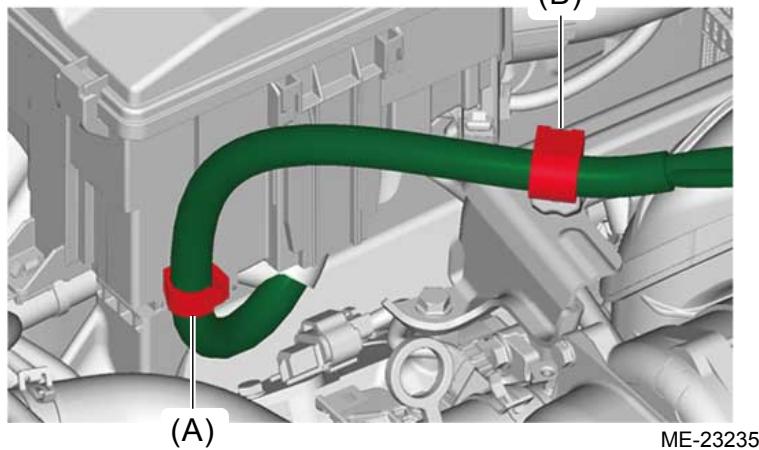
ZD-8AU



ME-23508

11. Secure the generator cord to the fuel pipe protector RH No. 1 with clip (B), and secure the generator cord to the main fuse box with clip (A).

ZD-8AJ



12. Install the nuts which hold the engine mounting to the crossmember COMPL front.

Caution:

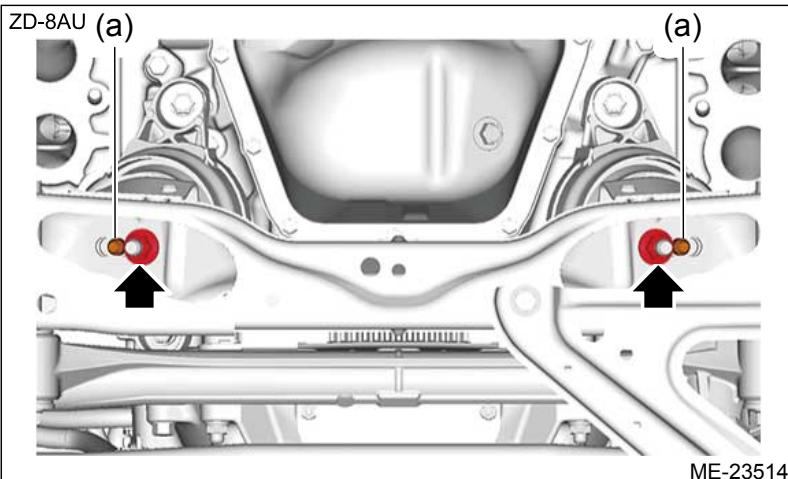
Be sure to use a new nut.

Note:

Make sure that locators (a) of the engine mounting are securely inserted.

Tightening torque:

90 N·m (9.2 kgf-m, 66.4 ft-lb)



13. Install the front exhaust pipe. [Ref. to EXHAUST\(H4DO\)>Front Exhaust Pipe>INSTALLATION.](#)

14. Install the ECM. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\)>INSTALLATION.](#)

15. Install the air intake boot. [Ref. to INTAKE \(INDUCTION\)\(H4DO\)>Air Intake Boot>INSTALLATION.](#)

16. Connect the ground terminal to battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)

17. Set the panel COMPL front hood to the normal position. [Ref. to REPAIR CONTENTS>NOTE > STAY ASSEMBLY FRONT HOOD.](#)

18. Fill engine oil. [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)

19. Check the select lever and adjust it if necessary. (AT model)

Inspection:

[Ref. to CONTROL SYSTEMS>Select Lever>INSPECTION.](#)

Adjustment:

[Ref. to CONTROL SYSTEMS>Select Lever>ADJUSTMENT.](#)

Note:

This procedure is required because the select lever may be deviated from the adjusted position due to installation/removal of the nut on the engine mounting.

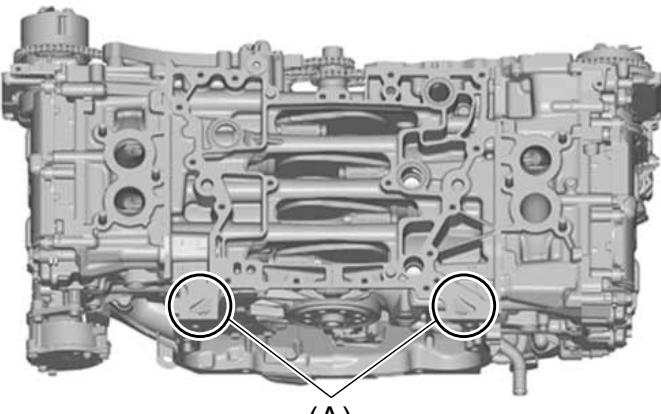
2. OIL PAN UPPER

- Check the portion (A) of the cylinder block as shown in the figure. If burrs are found, remove them.

Note:

Be sure to check for burrs which may be formed while the oil pan upper is removed.

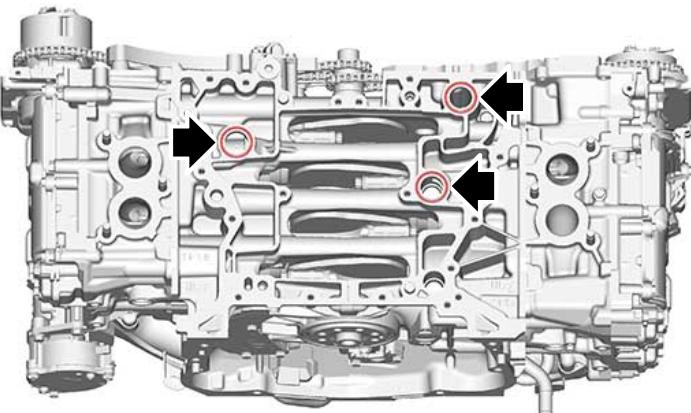
ZD-8A*



LU-10675

- Install a new O-ring to the cylinder block.

ZD-8A*



LU-10626

- Apply liquid gasket to the mating surface of the oil pan upper as shown in the figure, and temporarily install the oil pan upper to the cylinder block.

Note:

- Before applying liquid gasket, degrease the old liquid gasket seal surface of the oil pan upper and the cylinder block.
- Install within 5 min. after applying liquid gasket.
- Application of liquid gasket on the chamfer surface around the bolt hole is allowed.

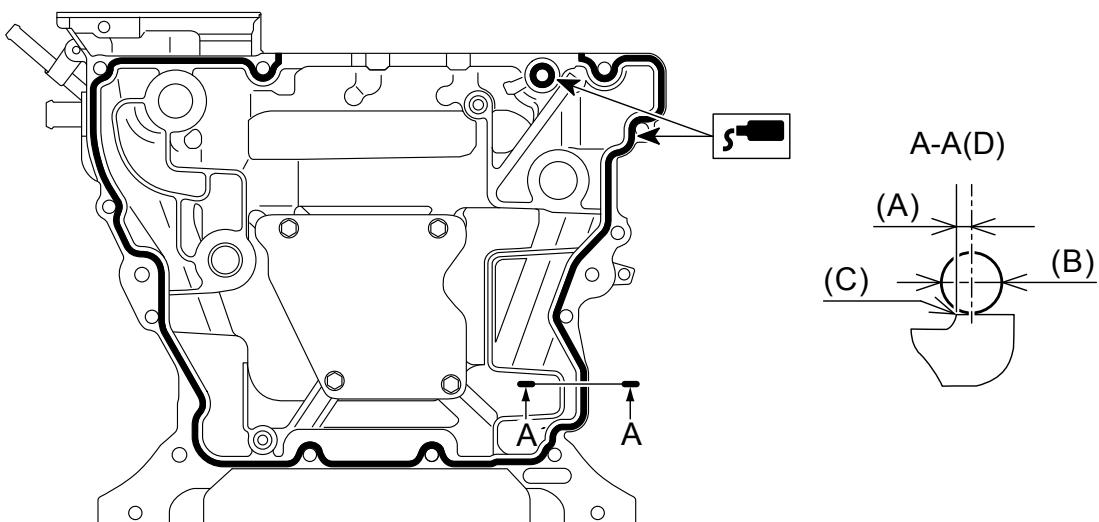
Liquid gasket:

THREE BOND 1217G (part No. K0877Y0100), THREE BOND 1217H or equivalent

Liquid gasket applying diameter:

$4 \pm 0.5 \text{ mm} (0.1575 \pm 0.0197 \text{ in})$

ZD-8A*



LU-10646

- (A) 0 mm (0 in) or more, 2.0 mm (0.0787 in) or less (C) Chamfer edge
(B) $\phi 4 \pm 0.5 \text{ mm}$ ($0.1575 \pm 0.0197 \text{ in}$) (D) Liquid gasket applying position

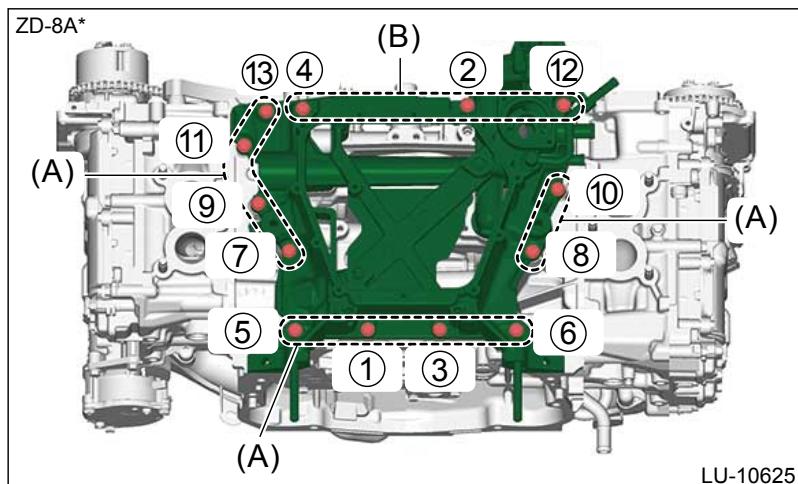
4. Tighten the bolts in the numerical order as shown in the figure.

Note:

After tightening, if the liquid gasket is squeezed out onto the seal surface of the chain cover, completely remove any squeezed-out liquid gasket.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)



(A) M8 × 25

(B) M8 × 50

5. Install the oil pan and oil strainer. [Ref. to LUBRICATION\(H4DO\)>Oil Pan>INSTALLATION > OIL PAN.](#)

6. Install the thermostat. Ref. to COOLING(H4DO)>Thermostat>INSTALLATION > ENGINE SIDE.
7. Install the water pipe. Ref. to COOLING(H4DO)>Water Pipe>INSTALLATION > WATER PIPE.
8. Install the engine. Ref. to MECHANICAL(H4DO)>Engine Assembly>INSTALLATION.
9. Fill engine oil. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT.
10. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
11. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.

LUBRICATION(H4DO) > Oil Pan

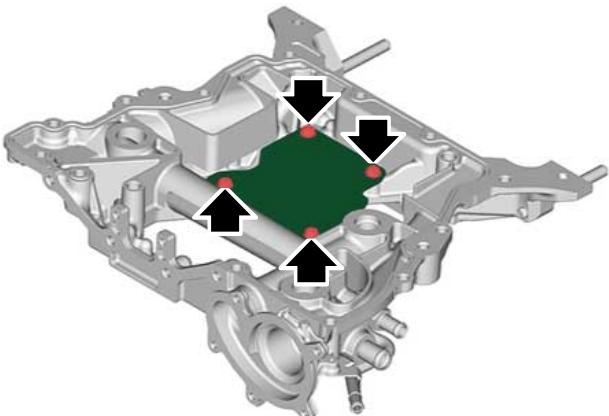
DISASSEMBLY



1. OIL PAN UPPER

1. Remove the water pump assembly. Ref. to COOLING(H4DO)>Water Pump>REMOVAL > WATER PUMP ASSY.
2. Remove the baffle plate.

ZD-8A*



LU-10627

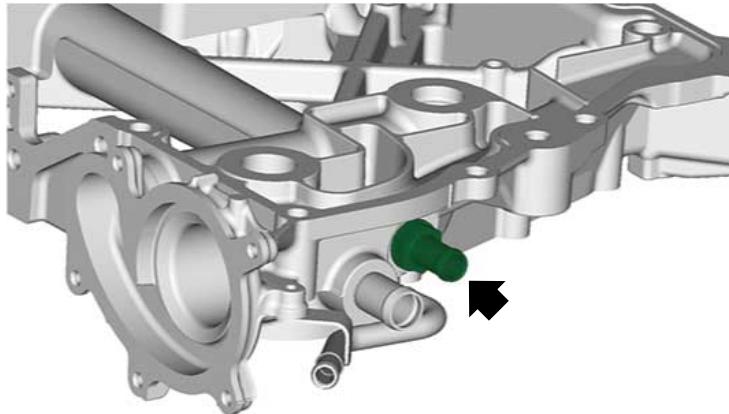
3. Remove the nipple (AT model) or the plug (MT model).

Note:

- Perform this procedure only when required.
- Remove the seal material from the thread hole of the oil pan upper.

- AT model

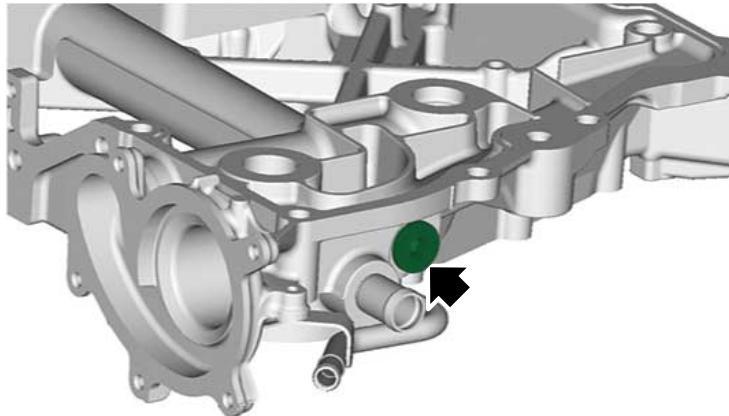
ZD-8A*



LU-10629

- MT model

ZD-8A*



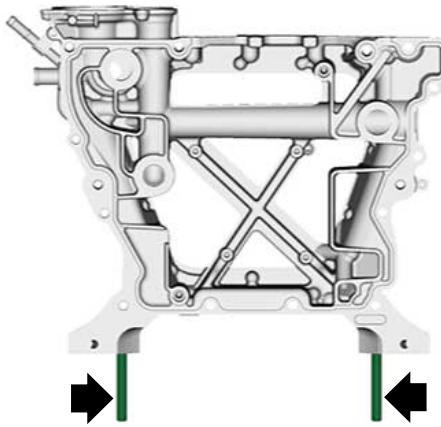
LU-10630

4. Remove the stud bolt.

Note:

Perform this procedure only when required.

ZD-8A*



LU-10628

LUBRICATION(H4DO) > Oil Pan

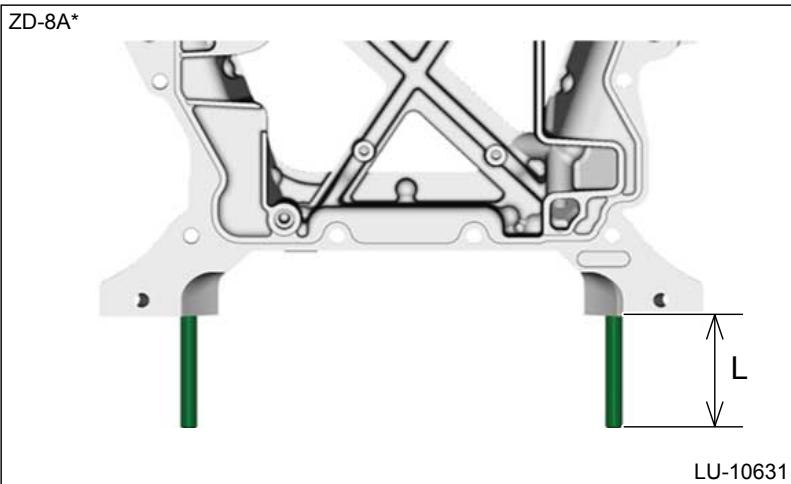
ASSEMBLY

1. OIL PAN UPPER

1. Tighten the stud bolt to the torque of 10 N·m (1.0 kgf-m, 7.4 ft-lb) until the exposed length "L" is as shown in the figure.

Exposed length L of stud bolt:

70 ± 1 mm (2.7559 \pm 0.0394 in)



2. Install a new nipple (AT model) or new plug (MT model).

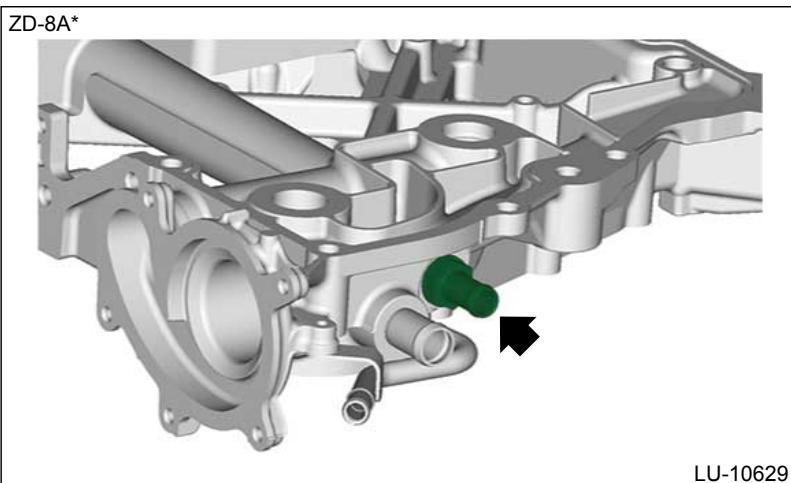
Note:

Before installing, degrease the thread hole of the oil pan upper.

Tightening torque:

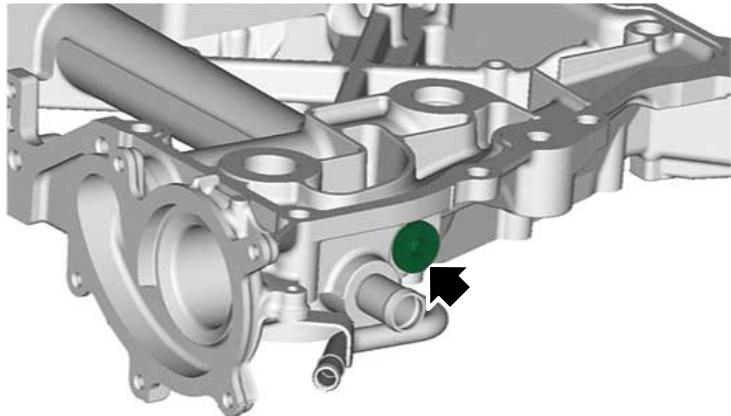
23 N·m (2.3 kgf-m, 17.0 ft-lb)

- AT model



- MT model

ZD-8A*



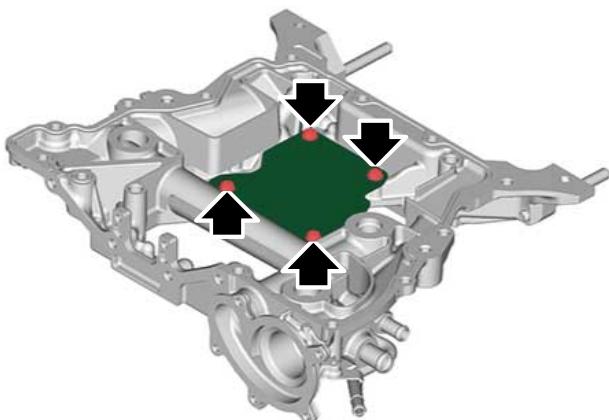
LU-10630

3. Install the baffle plate.

Tightening torque:

6.4 N·m (0.7 kgf·m, 4.7 ft-lb)

ZD-8A*



LU-10627

4. Install the water pump assembly.  [Ref. to COOLING\(H4DO\)>Water Pump>INSTALLATION > WATER PUMP ASSY.](#)

LUBRICATION(H4DO) > Oil Pan

INSPECTION

- 1.** Check for oil leaks.
- 2.** Check that there is no deformation, cracks or other damages.
- 3.** Check the oil passages for clogging.

LUBRICATION(H4DO) > Oil Pressure Switch

REMOVAL

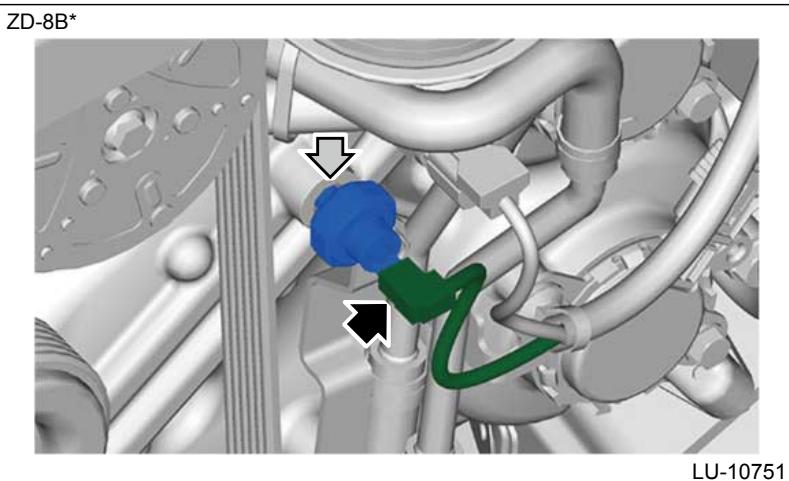
Caution:

If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.

1. Disconnect the ground terminal from battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
2. Remove the air cleaner case. [Ref. to INTAKE \(INDUCTION\)\(H4DO\)>Air Cleaner Case>REMOVAL.](#)
3. Disconnect the connector and remove the oil pressure switch.

Caution:

Use cloth to catch the engine oil in order to prevent it from splashing.



4. Remove seal material from the oil pressure switch and the thread portions of the chain cover.

LUBRICATION(H4DO) > Oil Pressure Switch

INSTALLATION

1. Apply seal material to the bolt threads of oil pressure switch.

Note:

Before applying the seal material, degrease the oil pressure switch and the thread portions of the chain cover.

Preparation items:

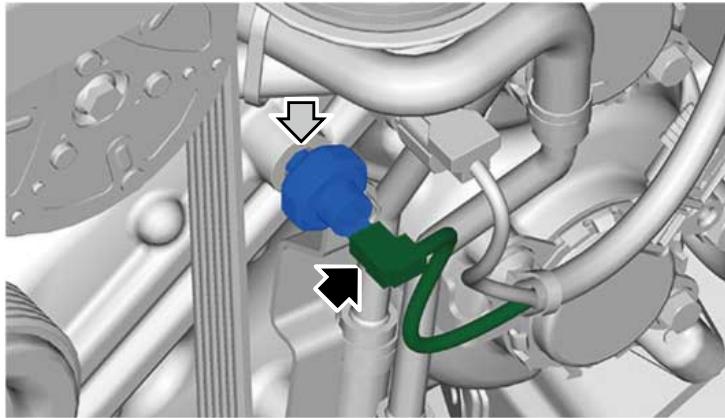
Seal material: THREE BOND 1324 (part No. 004403042) or equivalent

2. Install the oil pressure switch, and connect the connector.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

ZD-8B*



LU-10751

- 3.** Connect the ground terminal to battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
- 4.** Check the engine oil level and replenish the engine oil if necessary. [Ref. to LUBRICATION\(H4DO\)>Engine Oil>INSPECTION.](#)

LUBRICATION(H4DO) > Oil Pressure Switch

INSPECTION

- 1.** Check for oil leaks.
- 2.** Check that there is no deformation, cracks or other damages.

LUBRICATION(H4DO) > Engine Oil Cooler

REMOVAL



Caution:

- **Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.**
- **If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.**

1. ENGINE OIL COOLER

1. Disconnect the ground terminal from battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Drain engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > DRAINING OF ENGINE COOLANT.
3. Perform the steps below to remove the air intake boot, and place it aside so that it does not interfere with the work.

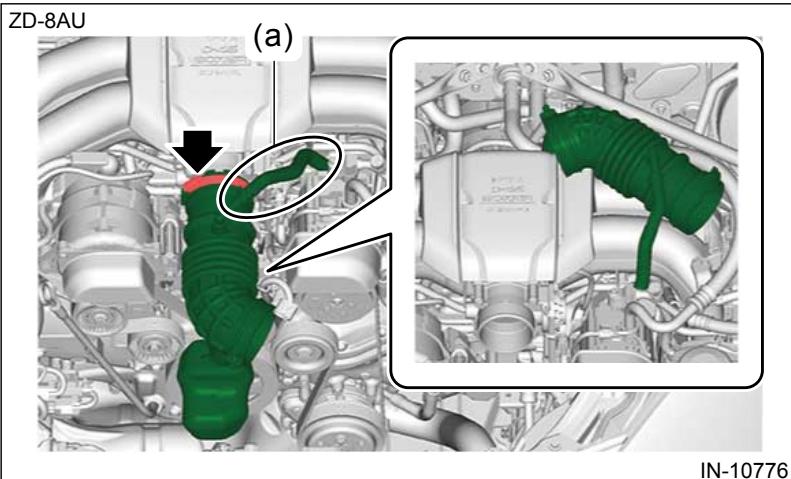
Caution:

Do not disconnect the PCV hose No. 2 (a).

- (1) Remove the air cleaner case. Ref. to INTAKE (INDUCTION)(H4DO)>Air Cleaner Case>REMOVAL.
- (2) Loosen the clamp, remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

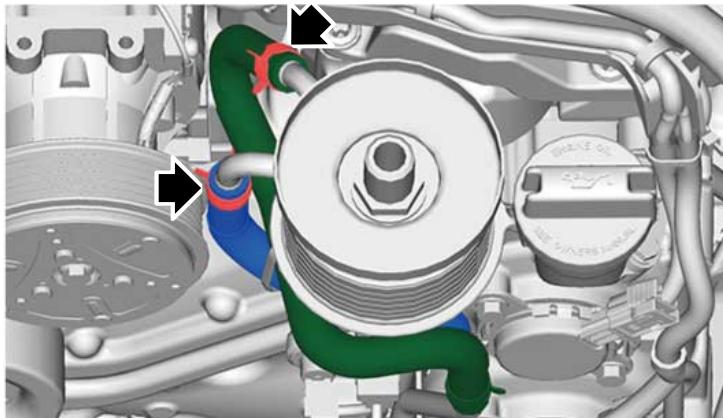
Be careful not to pull out the PCV hose No. 2 (a).



IN-10776

4. Remove the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>REMOVAL.
5. Remove the oil filter. Ref. to LUBRICATION(H4DO)>Oil Filter>REMOVAL.
6. Disconnect the water hose from the engine oil cooler.

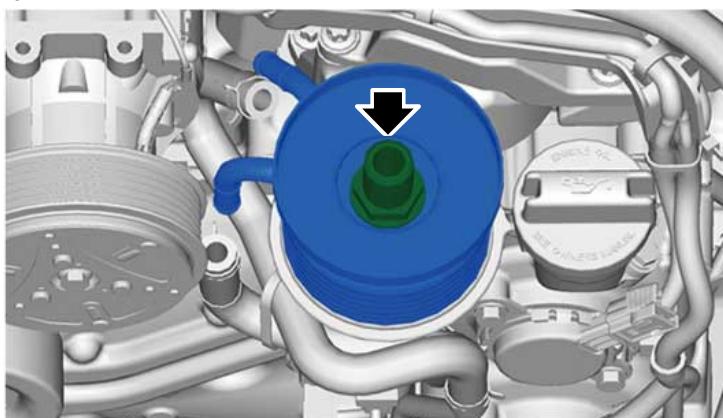
ZD-8B*



LU-10752

7. Using a deep socket (24 mm in width), remove the oil cooler connector, and remove the engine oil cooler.

ZD-8B*



LU-10753

2. ENGINE OIL COOLER PIPE

1. Disconnect the ground terminal from battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
2. Drain engine coolant. [Ref. to COOLING\(H4DO\)>Engine Coolant>REPLACEMENT > DRAINING OF ENGINE COOLANT.](#)
3. Perform the steps below to remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

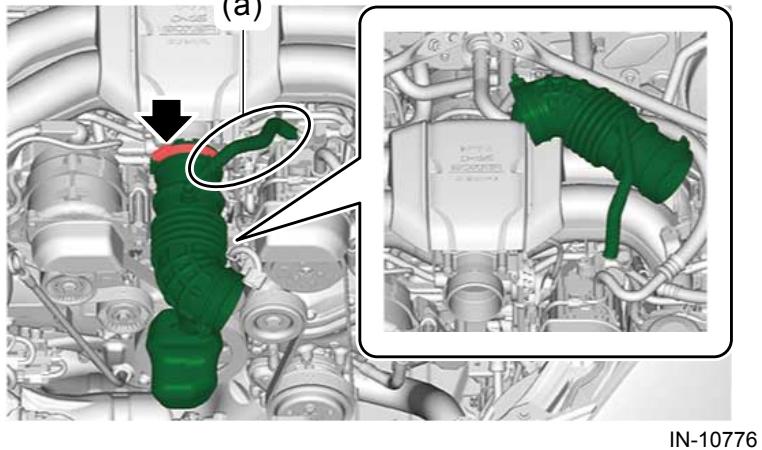
Do not disconnect the PCV hose No. 2 (a).

- (1) Remove the air cleaner case. [Ref. to INTAKE \(INDUCTION\)\(H4DO\)>Air Cleaner Case>REMOVAL.](#)
- (2) Loosen the clamp, remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

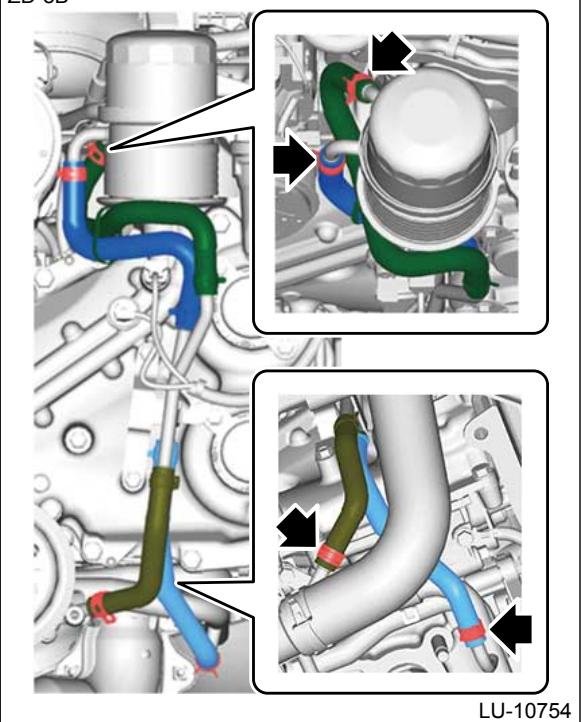
Be careful not to pull out the PCV hose No. 2 (a).

ZD-8AU



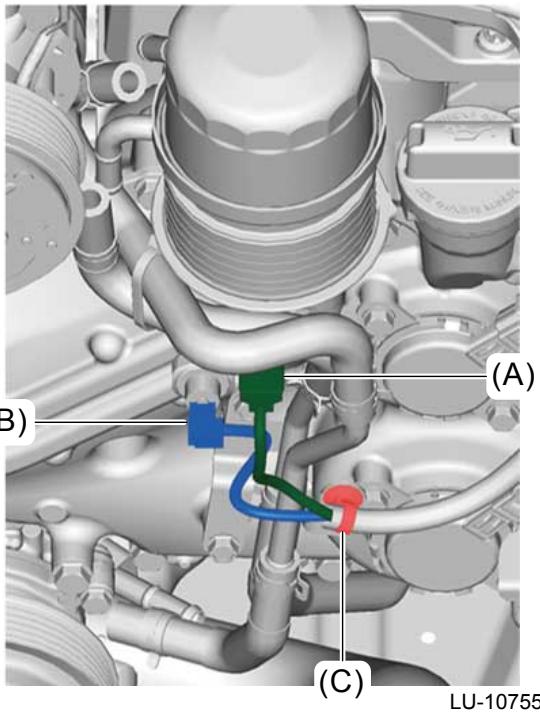
4. Remove the V-belts. [Ref. to MECHANICAL\(H4DO\)>V-belt>REMOVAL.](#)
5. Remove the front exhaust pipe. [Ref. to EXHAUST\(H4DO\)>Front Exhaust Pipe>REMOVAL.](#)
6. Disconnect the water hoses.

ZD-8B*



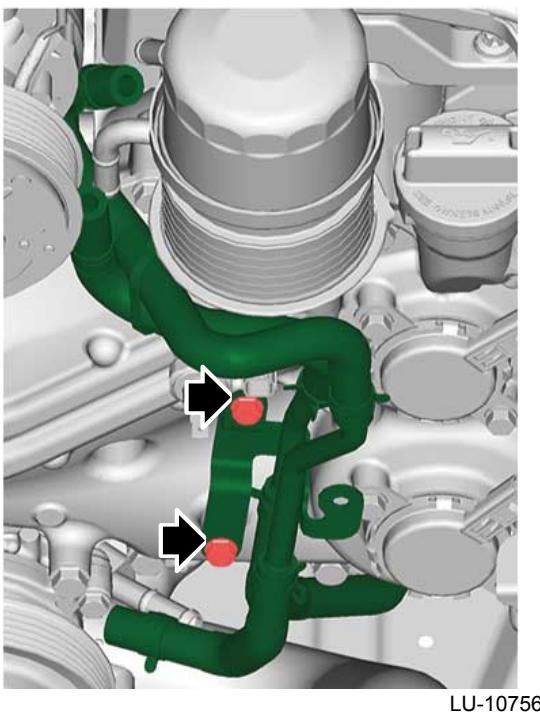
7. Disconnect the engine oil temperature sensor connector (A) and oil pressure switch connector (B), and remove the clip (C).

ZD-8B*



8. Remove the bolt and remove the engine oil cooler pipe together with the water hose.

ZD-8B*

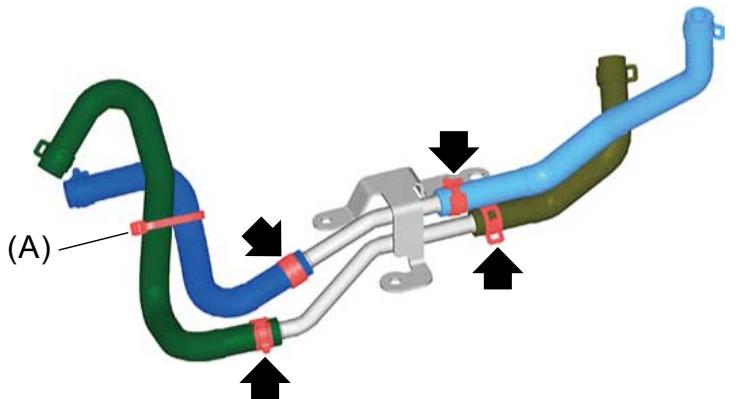


9. Cut the tie-wrap (A) securing the water hose using nippers, etc., and disconnect each water hose from the engine oil cooler pipe.

Note:

Perform this procedure only when required.

ZD-8B*



LU-10757

LUBRICATION(H4DO) > Engine Oil Cooler

INSTALLATION

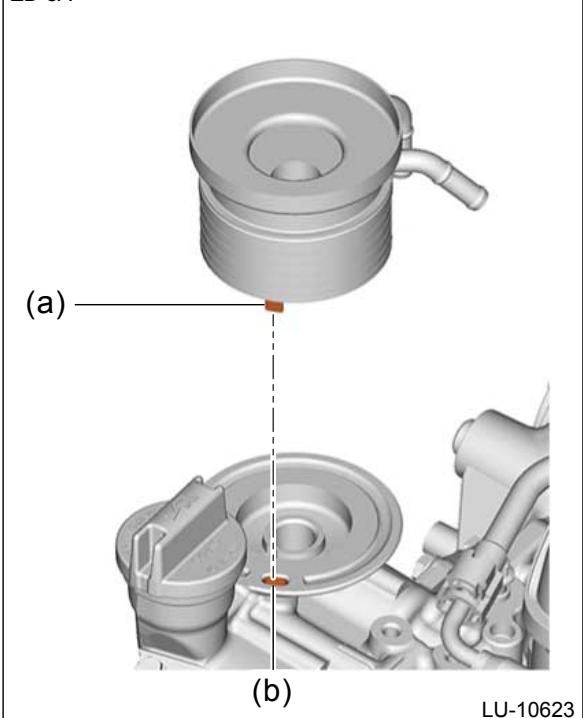
1. ENGINE OIL COOLER

1. Using a new gasket, set the engine oil cooler.
2. Using a deep socket (24 mm in width), install the oil cooler connector.

Note:

Align the rotation stopper (a) of the engine oil cooler with the chain cover groove (b).

ZD-8A*

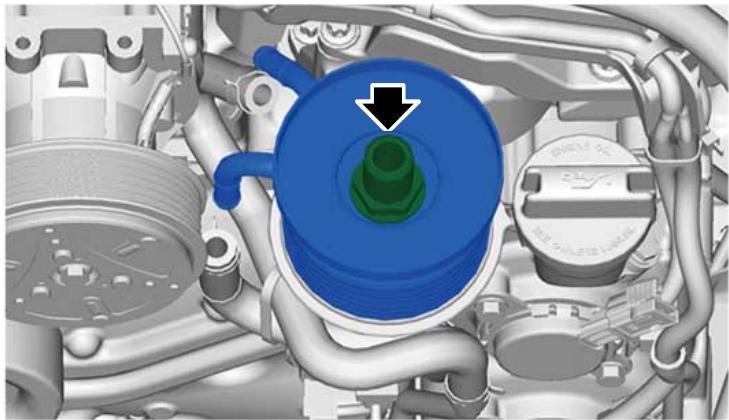


LU-10623

Tightening torque:

45 N·m (4.6 kgf-m, 33.2 ft-lb)

ZD-8B*



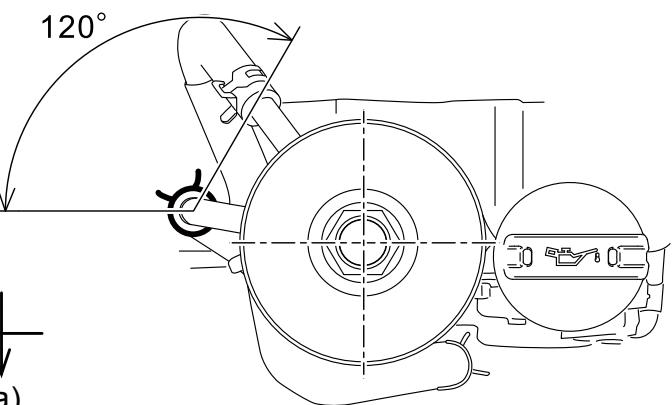
LU-10753

- 3.** Connect the water hose.

Note:

- For the water hose (OUT side), align the direction of the clip within the range shown in the figure.

ZD-8B*

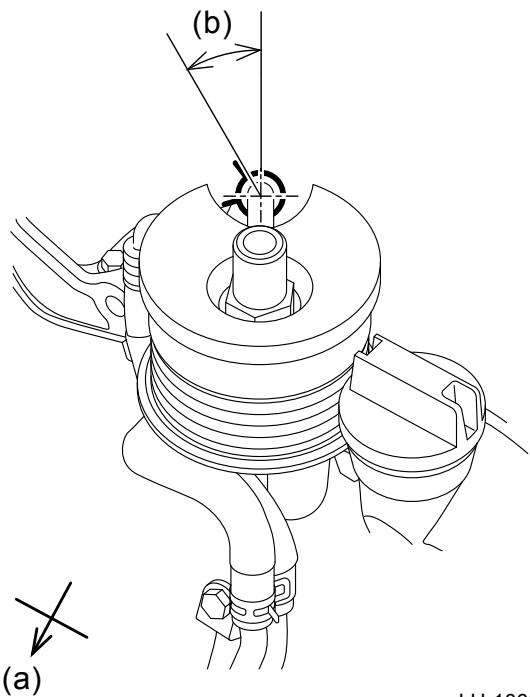


LU-10758

(a) Front of engine

- For the water hose (IN side), set the direction of the clip facing toward the front of engine away from the range (b) shown in the figure.

ZD-8A*

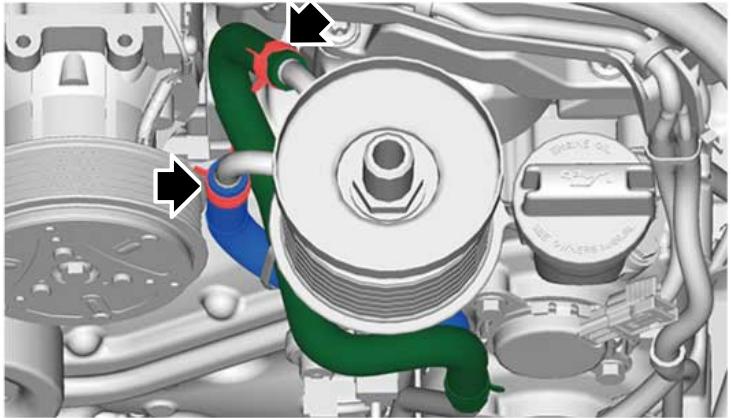


LU-10665

(a) Front of engine

(b) 30°

ZD-8B*



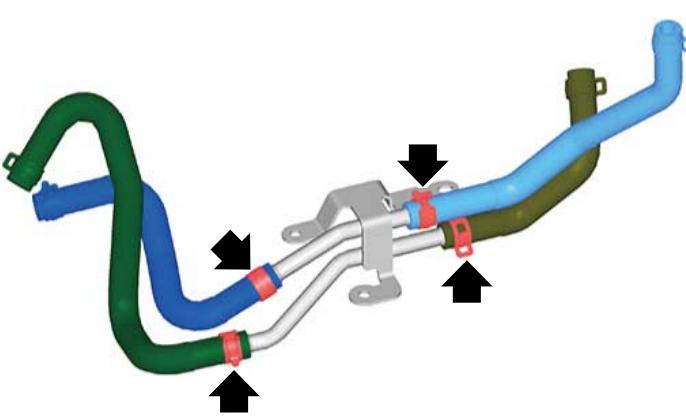
LU-10752

4. Install the oil filter. [Ref. to LUBRICATION\(H4DO\)>Oil Filter>INSTALLATION.](#)
5. Install the V-belts. [Ref. to MECHANICAL\(H4DO\)>V-belt>INSTALLATION > V-BELT.](#)
6. Connect the ground terminal to battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
7. Fill engine coolant. [Ref. to COOLING\(H4DO\)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.](#)
8. Check the engine oil level and replenish the engine oil if necessary. [Ref. to LUBRICATION\(H4DO\)>Engine Oil>INSPECTION.](#)

2. ENGINE OIL COOLER PIPE

1. Connect each water hose to the engine oil cooler pipe.

ZD-8B*



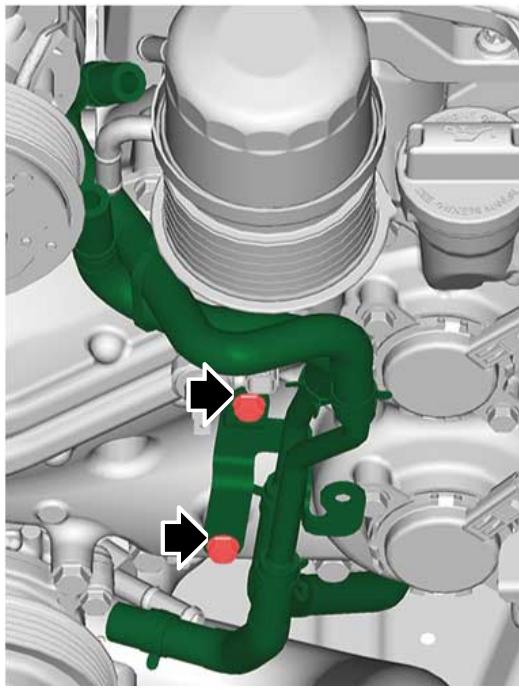
LU-10759

2. Install the engine oil cooler pipe to the chain cover.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

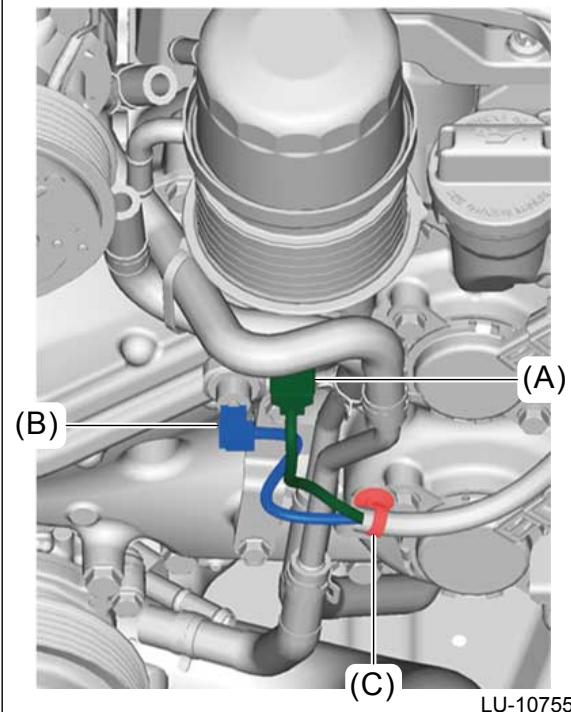
ZD-8B*



LU-10756

3. Connect the engine oil temperature sensor connector (A) and oil pressure switch connector (B), and install the clip (C).

ZD-8B*



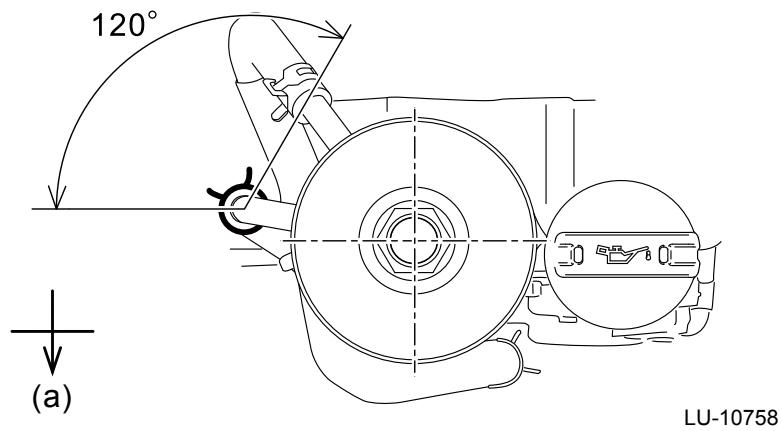
LU-10755

4. Connect the water hose.

Note:

- For the water hose (OUT side) of the oil cooler side, align the direction of the clip within the range shown in the figure.

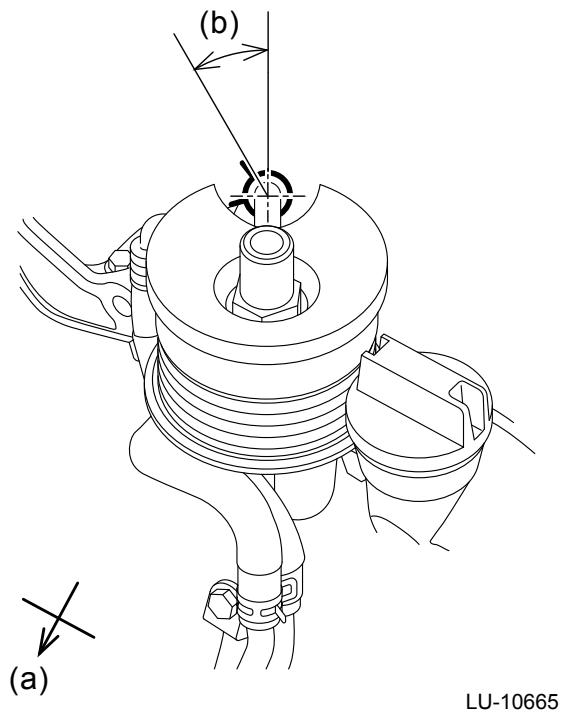
ZD-8B*



(a) Front of engine

- For the water hose (IN side) of the oil cooler side, set the direction of the clip facing toward the front of engine away from the range (b) shown in the figure.

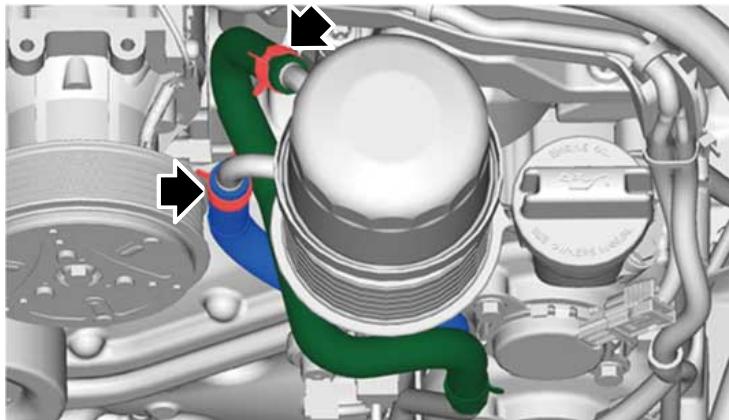
ZD-8A*



(a) Front of engine

(b) 30°

ZD-8B*



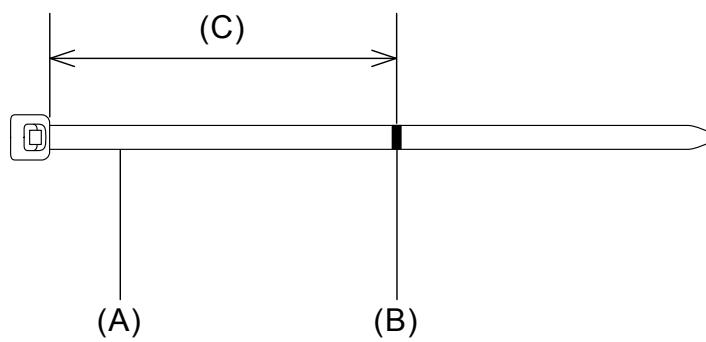
5. If the tie-wrap securing the water hose is cut, follow the procedure below to install it.

Note:

This procedure is required to prevent interference between the V-belt and water hose.

- (1) Mark a new tie-wrap.

ZD-8A*



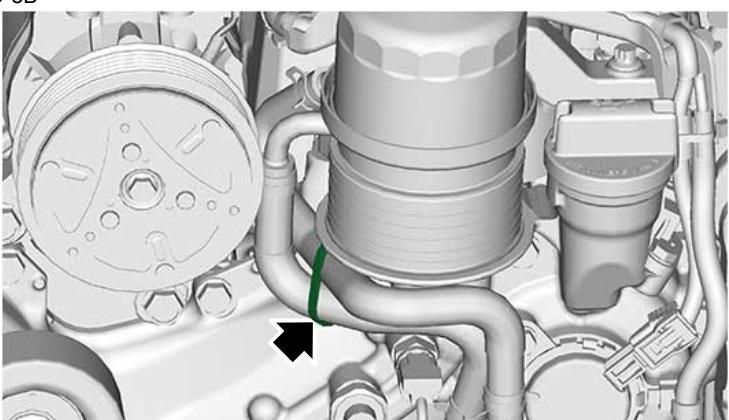
(A) Tie-wrap

(B) Marking position

(C) 90 mm (3.54 in)

- (2) Attach the marked tie-wrap to the position shown in the figure, and secure the water hose.

ZD-8B*



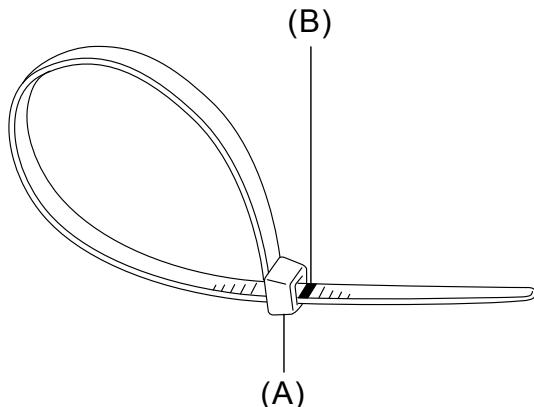
- (3) Tighten the tie-wrap until the fastening portion (A) of the tie-wrap aligns with the marking position

(B), and cut the end.

Note:

- This procedure is required to secure the appropriate tightening force.
- Cut the tie-wrap end so that the length of the protruding part is 3 mm (0.12 in) or less.

ZD-8A*



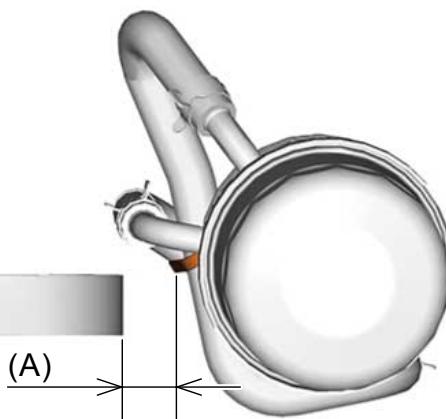
LU-10674

6. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.
7. Install the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>INSTALLATION > V-BELT.

Caution:

Make sure that the clearance (A) between the water hose and the V-belt is 11.2 mm (0.4409 in) or more. If the value is lower than the specified value, adjust the installation angle of the water hose so that the value is within the specified range.

ZD-8B*



LU-10762

8. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
9. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.

LUBRICATION(H4DO) > Engine Oil Cooler

INSPECTION

1. Check that there is no deformation, cracks or other damages.
2. Check that there are no cracks, damage or loose part.

- 3.** Blow with compressed air to make sure the coolant passages are not clogged.
- 4.** Check the oil cooler installing area of chain cover for damage.

LUBRICATION(H4DO) > Oil Pipe

REMOVAL

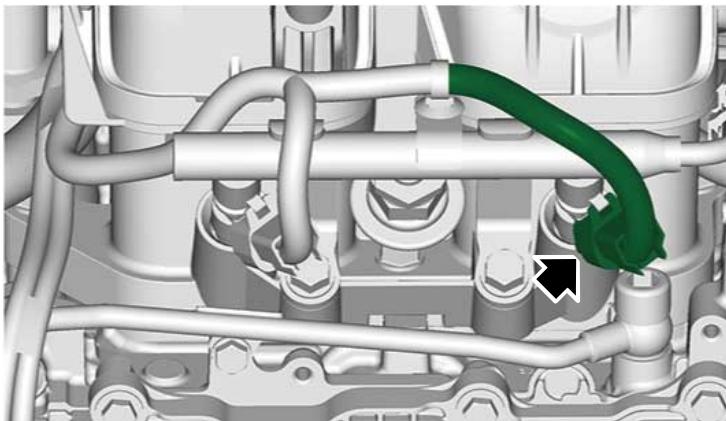


Caution:

If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.

1. Disconnect the ground terminal from battery sensor.  Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the ECM.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
3. Remove the fuel pipe protector RH No. 2.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pipe Protector>REMOVAL>FUEL PIPE PROTECTOR RH >FUEL PIPE PROTECTOR RH NO. 2.
4. Disconnect the connector from the #1 fuel injector.

ZD-8A*



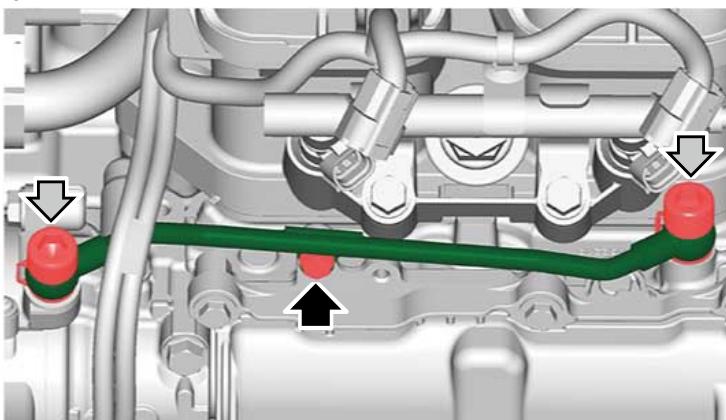
LU-10637

5. Remove the bolt and union bolt, and remove the oil pipe.

Caution:

Use cloth to catch the engine oil in order to prevent it from splashing.

ZD-8A*



LU-10638

LUBRICATION(H4DO) > Oil Pipe

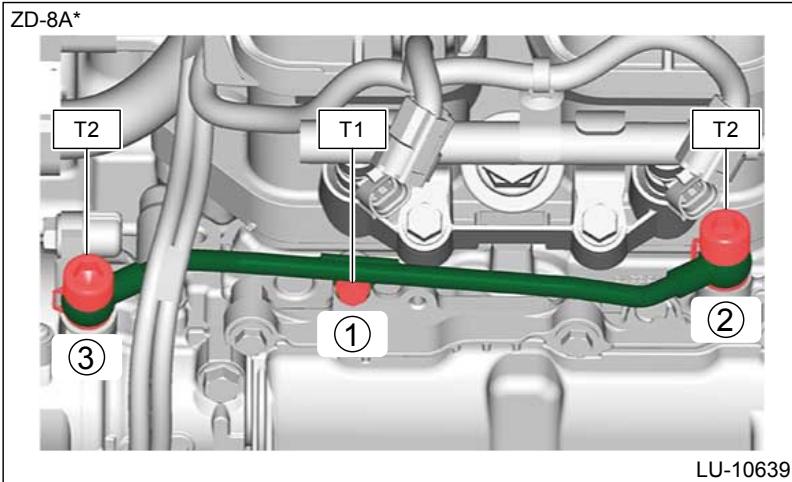
INSTALLATION

1. Apply engine oil to the threaded portion for mounting the union bolt on the vacuum pump and cam carrier.
2. Use a new gasket to temporarily attach the oil pipe.
3. Tighten the bolts and union bolts in the numerical order as shown in the figure.

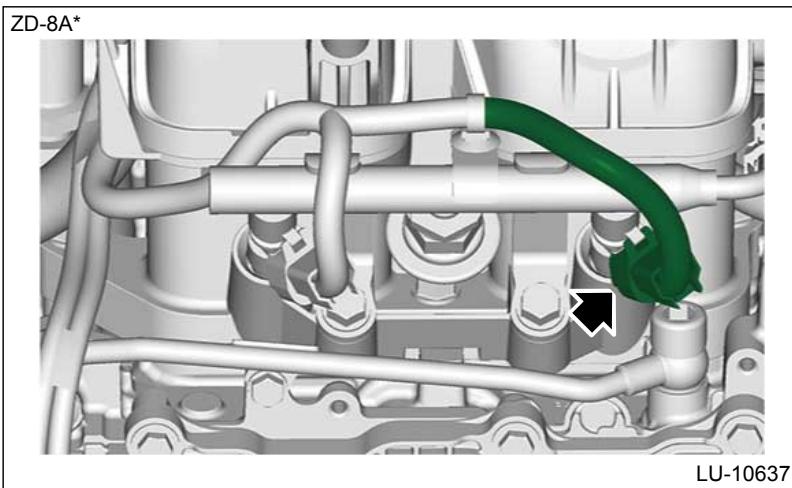
Tightening torque:

T1: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

T2: 20 N·m (2.0 kgf-m, 14.8 ft-lb)



4. Install the connector to the #1 fuel injector.



5. Install the fuel pipe protector RH No. 2. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pipe Protector>INSTALLATION>FUEL PIPE PROTECTOR RH >FUEL PIPE PROTECTOR RH NO. 2.](#)
6. Install the ECM. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\)>INSTALLATION.](#)
7. Connect the ground terminal to battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
8. Check the engine oil level and replenish the engine oil if necessary. [Ref. to LUBRICATION\(H4DO\)>Engine Oil>INSPECTION.](#)

LUBRICATION(H4DO) > Oil Pipe

INSPECTION

- 1.** Check for oil leaks.
- 2.** Check that there is no deformation, cracks or other damages.
- 3.** Check the oil passages for clogging.

LUBRICATION(H4DO) > Symptoms and causes

INSPECTION

Before performing diagnostics, make sure that the engine oil level is correct and no oil leakage exists.

Symptoms	Problem parts etc.	Possible cause
The oil pressure warning light illuminates.	Oil pressure switch	Oil pressure switch failure
	Oil filter	Clogging of oil filter, malfunction of by-pass valve
	Oil strainer	Clogging of oil strainer
	Engine oil passages	Clogging of engine oil passage
	Oil pump	Wear or damage of the oil pump
	Engine oil	Incorrect engine oil or engine oil deterioration
The oil pressure warning light does not illuminate.	Wiring harness	Short circuit of wiring harness
	Combination meter	Defective combination meter
	Oil pressure switch	Oil pressure switch failure
	Wiring harness	Open circuit of wiring harness